Negotiation in dyads and groups: the effects of social and epistemic motives

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Citation for published version (APA):
ten Velden, F. S. (2008). Negotiation in dyads and groups: the effects of social and epistemic motives
Amsterdam: Kurt Lewin Instituut
CHAPTER 3

It takes one to tango: The effects of Dyads' Epistemic Motivation Composition in Negotiation

When making deals or solving conflicts, negotiators often face situations that are ambiguous and messy: They lack full and accurate insight into the structure of the social situation, they lack information about their counterpart's utility functions in that they do not know what is and what is not important to their counterpart, they do not know the amount of gain or loss their counterpart faces on specific issues, and they do not know what the goals are their counterpart strives for. Furthermore, individuals in negotiation might have many good reasons to doubt the accuracy and trustworthiness of information about their counterpart's utility functions (Pruitt & Carnevale, 1993; De Dreu, Beersma, Van Kleef, & Steinel, 2007). Thus, to understand negotiation, we need to study how individual negotiators make sense of their social environment: What types of information are they looking for? What kind of information do people need before making a strategic decision? How thoroughly does information that becomes available during interaction get processed and integrated into existing knowledge structures? How does all this influence the nature of the strategic interaction and the quality of the agreements people reach?

Past work on these and related questions adopted a motivated information processing perspective (De Dreu & Carnevale, 2003). It is assumed that people process information in a shallow, heuristic and automatic fashion or, instead, process information systematically and deliberately. In the case of heuristic information processing negotiators tend to rely on a fixed-pie assumption (e.g., Thompson & Hastie, 1990), on stereotypes (e.g., Morris, Larrick, & Su, 1999), and are heavily influenced by anchoring (Ritov, 1996) and framing (e.g., Bottom & Studt, 1993). These biases and heuristics often prohibit the development of an accurate understanding of the task and the discovery of mutually beneficial, integrative agreements. In the case of systematic information processing, negotiators are less likely to rely on these detrimental heuristics and base their judgments and decisions on thoroughly processed information. As a result, high quality, integrative agreements are more likely (e.g., De Dreu & Carnevale, 2003).

Although this motivated information processing perspective has advanced our understanding of when and how negotiators make sense of their ambiguous situation, and how this subsequently affects the outcomes they and their counterparts achieve, a few critical issues are still poorly understood. Specifically, past work left unclear how much systematic processing within the negotiation pair is needed, and whether high quality agreements require both, or just one party to
engage in deep and deliberate information processing. It is these and related issues the present research was concerned with. We examine whether and how differences between individuals within a negotiation pair in the depth with which information is processed influences negotiation processes and the quality of the agreements negotiators reach – do high quality agreements require both, or just one individual within a negotiation pair to engage in deep and deliberate processing of information, and why?

**Motivated Information Processing in Negotiation**

Whether individuals engage in shallow and heuristic, or deep and systematic information processing is assumed to depend on individuals’ epistemic motivation – the willingness to expand effort to develop a rich and accurate understanding of the world, including the negotiation problem (De Dreu & Carnevale, 2003; also see Kruglanski, 1989). Epistemic motivation can be rooted in individual differences in Need for Cognitive Closure (Kruglanski & Webster, 1996), Need for Cognition (Cacioppo, Petty, Feinstein, & Jarvis, 1996) or Personal Need for Structure (Thompson, Naccarato, Parker, & Moskowitz, 2001). In Experiment 3.1 of this chapter, epistemic motivation was operationalized as personal need for structure. Need for structure is associated with increased reliance on stereotypes (Schaller, Boyd, Yohannes, & O’Brien, 1995; Thompson, Roman, Moskowitz, Chaiken, & Bargh, 1994), increased social categorization (Moskowitz, 1993) and increased simplification of the problem at hand (Thompson et al., 2001). For example, individuals with a high personal need for structure are characterized by a chronic preference for simplicity and structure, view the world in less complex ways, and often rely on heuristic processing of information that is based on well-learned associations.

Alternatively, epistemic motivation may be rooted in the situation. For example, time pressure has been shown to lower epistemic motivation (Kruglanski & Webster, 1996), as has environmental noise (e.g., Kruglanski, Webster, & Klem, 1993) and process accountability (Tetlock, 1992). In Experiment 3.2 of this chapter, epistemic motivation was manipulated by inducing process accountability. Under process accountability, individuals expect to be observed and evaluated by others with unknown views about the process of judgement and decision-making (Lerner & Tetlock, 1999; Tetlock, 1992). Individuals held process accountable evaluate decision alternatives more thoroughly (Simonson & Staw, 1992) and rely less on heuristic cues (Lerner & Tetlock, 1999).

Higher epistemic motivation (lower personal need for structure, less process accountability) relates to more systematic information processing, makes individuals less influenced by (inaccurate) heuristics, and tends to lead to more integrative, high
quality agreements (De Dreu, Koole, & Oldersma, 1999; De Dreu, Koole, & Steinel, 2000). For example, De Dreu, Koole et al. (2000) examined pairs of individuals who negotiated face-to-face and were, or were not told that after the negotiation they had to account in an interview for the decision they had made, the underlying reasons for (not) doing something, and so on. Prior to and immediately after the negotiation fixed-pie perceptions were assessed. Results showed that pairs of negotiators under process accountability reached higher joint outcomes and had more accurate post-negotiation understanding of the task (i.e., lower fixed-pie perceptions) than pairs of negotiators that were not under process accountability. Because revised fixed-pie perceptions mediated the effects of process accountability on joint outcomes, the authors concluded that epistemic motivation has its effects on agreement because it influences the depth of information processing.

Heterogeneity in Epistemic Motivation: The Present Research

As mentioned, past work on epistemic motivation in negotiation left unclear, both theoretically and empirically, whether the effects of epistemic motivation reside at the level of the individual, the negotiation dyad, or both. Some research focused at individuals, and some work focused on dyad and group-level effects. As a result, we do not know whether the development of high quality agreements requires both parties, or just one, to have high epistemic motivation. Related, whereas epistemic motivation resides at the individual level of analysis, negotiation takes place in pairs or small groups of individuals. It may be that all individuals within a pair or small group share the same level of epistemic motivation – all share the same need for structure, or all are process accountable to the same extent. However, it is at least equally likely that within pairs individuals differ in their epistemic needs. Someone with low need for cognition may negotiate with someone having high need for cognition (Sestowsky, Wegener, & Fabrigar 1998; Schei, Rognes, & Mykland, 2006). Whereas one party may experience high time pressure, his or her counterpart may not (cf., Moore, 2004). Whereas some negotiators at the table may be process accountable, others may not (cf., Tetlock, 1992). Put differently, when applying the concept of epistemic motivation to interpersonal processes including negotiation, we need to take into account, both conceptually and empirically, that groups and dyads may be homogeneous or heterogeneous in individual epistemic needs.

Work by Thompson (1991) showed that when one negotiator provided or sought information the dyad as a whole benefited and increased the collective outcome. Especially in tasks that have integrative potential, understanding of the counterpart’s preferences is a prerequisite for obtaining high quality agreements.
From this work, and the motivated information processing perspective outlined above, it would follow that it takes just one negotiator with high epistemic motivation to lead the entire pair to achieve high quality agreements. This first hypothesis was tested in Experiment 3.1. Individual difference in Need for Structure was assessed, a trait closely related to Need for Cognitive Closure – the desire for a firm, unambiguous answer (Kruglanski, 1989), with correlations ranging from .67 to .79. In fact, Kruglanski et al. (1997) note that "...need for closure and need for structure refer to one and the same thing, that is, a single lay-epistemic construct of which the NFCS and the PNS are two operational definitions" (p. 1006) and Neuberg, Judice, and West (1997) note that the Need for Closure scale comprises of two factors: Need for Structure and Decisiveness. We created pairs of negotiators with both low need for structure, with both high need for structure, and with different levels of need for structure. Based on Thompson (1991) and the motivated information processing perspective, it was expected that mixed pairs would achieve as high quality agreements as pairs in which both members have low need for structure (i.e., high epistemic motivation); both mixed and high pairs would outperform pairs in which both members have high need for structure (i.e., low epistemic motivation).

**Experiment 3.1**

**Method**

*Participants and Design*

One hundred two students from the University of Amsterdam (25 men) participated in the study, for which they received course credit. Participants were randomly assigned to 51 dyads. Dyads differed in gender composition and average age, but these variables had no effects on the dependent variable and are not discussed further. The design was a one variable factorial, with personal need for structure as the independent variable, which varied between-dyads (either both members had high need for structure, or one member had high and the other had low need for structure, or both members had low need for structure).

*Negotiation Task and Assessment of Personal Need for Structure*

*Task and procedure.* Upon arrival in the laboratory, participants were placed in individual cubicles preventing them from seeing or communicating with other participants. Each participant received a folder containing the instructions for a negotiation in which they would take part. The instructions described an upcoming negotiation modelled after those used in past research (De Dreu, Beersma, Stroebe, & Euwema, 2006; also see Pruitt & Lewis, 1975). Participants were told they were to assume the role of a bartender who would negotiate with a colleague about the work
schedules for the next two months. The issues to be negotiated included, (1) the amount of hours each would tend bar instead of waiting tables, (2) the distribution rules for tips, (3) the evenings they would work, and (4) how often each would clean up, see Table 3.1.

As can be seen, each Bartender can reach an outcome between 0 (in case of no agreement, or total victory to the other) and 500 (in case of a total defeat of the other). As can also be seen, some issues are more important (i.e., provide more points) than others, and rank order in terms of importance differs within dyads. That is, bartending is most important to both Bartender A and Bartender B, but whereas the distribution of tips is second most important to Bartender A it is least important to Bartender B. Vice versa, which evenings to work is second most important to Bartender B but least important to Bartender A. Thus, negotiators would earn higher joint outcomes when Bartender A gets his or her way on the distribution of tips and Bartender B gets his or her way on which evenings they work [Joint Outcomes: \(90 + 150 + 0 + 60\) + \(90 + 0 + 150 + 60\) = 600], compared to an agreement that simply splits the difference on all four issues [Joint Outcomes: \(90 + 30 + 90 + 60\) + \(90 + 30 + 90 + 60\) = 540] or a total victory to one [Joint Outcomes: \(180 + 50 + 150 + 120\) + \(0 + 0 + 0 + 0\) = 500. Because individuals did not receive their counterpart’s issue chart, and were told not to exchange these issue charts during the negotiation, they were unaware of the integrative potential in the task, and through negotiation and the exchange and processing of information they had to uncover possibilities for trade-off and high joint gain.

After participants had read their role instructions, both dyad members were placed in the same cubicle and were given twenty minutes to discuss their case and to reach an agreement face-to-face. After twenty minutes of negotiation, or before if dyads reached an agreement earlier, the experimenter collected the materials, after which participants were fully debriefed and thanked for their participation.

Personal Need for Structure. Personal need for structure (PNS; Thompson et al., 2001) was assessed by the 12-item Personal Need for Structure scale. The scale proved reliable, Cronbach’s \(\alpha\) = .78. Participants could answer on a five-point scale, ranging from 1 = completely disagree, to 5 = completely agree. To facilitate comparison across different studies and similar questionnaires, a median split (\(Md\) = 3.14) was performed on the PNS data (cf. Kruglanski et al., 1997). Based on the median split, we created three different dyad compositions, so that dyad members both had high personal need for structure (\(n = 12\)), were mixed (\(n = 23\)), or both had low personal need for structure (\(n = 16\)).
Table 3.1  
*Profit Schedules for Bartender A and Bartender B (Experiment 3.1)*

<table>
<thead>
<tr>
<th>Bartender A</th>
<th>Bartending vs. Waiting Tables</th>
<th>Distribution of Tips</th>
<th>Evenings to Work Together</th>
<th>Times You Clean</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 hours (180)</td>
<td>100% in pot (50)</td>
<td>Monday (150)</td>
<td>0x (120)</td>
<td></td>
</tr>
<tr>
<td>5 hours (150)</td>
<td>80% in pot (40)</td>
<td>Tuesday (120)</td>
<td>1x (100)</td>
<td></td>
</tr>
<tr>
<td>4 hours (120)</td>
<td>60% in pot (30)</td>
<td>Wednesday (90)</td>
<td>2x (80)</td>
<td></td>
</tr>
<tr>
<td>3 hours (90)</td>
<td>40% in pot (20)</td>
<td>Thursday (60)</td>
<td>3x (60)</td>
<td></td>
</tr>
<tr>
<td>2 hours (60)</td>
<td>20% in pot (10)</td>
<td>Friday (30)</td>
<td>4x (40)</td>
<td></td>
</tr>
<tr>
<td>1 hours (30)</td>
<td>0% in pot (0)</td>
<td>Saturday (0)</td>
<td>5x (20)</td>
<td></td>
</tr>
<tr>
<td>0 hours (0)</td>
<td></td>
<td></td>
<td>6x (0)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bartender B</th>
<th>Bartending vs. Waiting Tables</th>
<th>Distribution of Tips</th>
<th>Evenings to Work Together</th>
<th>Times Other Cleans</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 hours (0)</td>
<td>100% in pot (0)</td>
<td>Monday (0)</td>
<td>0x (0)</td>
<td></td>
</tr>
<tr>
<td>5 hours (30)</td>
<td>80% in pot (30)</td>
<td>Tuesday (10)</td>
<td>1x (20)</td>
<td></td>
</tr>
<tr>
<td>4 hours (60)</td>
<td>60% in pot (60)</td>
<td>Wednesday (20)</td>
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</tr>
<tr>
<td>1 hours (150)</td>
<td>0% in pot (150)</td>
<td>Saturday (50)</td>
<td>5x (100)</td>
<td></td>
</tr>
<tr>
<td>0 hours (180)</td>
<td></td>
<td></td>
<td>6x (120)</td>
<td></td>
</tr>
</tbody>
</table>

Note. *Numbers in brackets refer to points earned by the participant.*

**Dependent variable**

The dependent variable was joint outcomes, which was calculated by summing the outcomes of both dyad members. The lowest possible joint outcomes was zero points (when a dyad failed to reach agreement), and the highest possible joint outcomes was 600 points. In addition, the absolute difference between both negotiators' outcomes was calculated to investigate asymmetry in outcomes.

**Results**

All dyads reached agreement. It was predicted that dyads would reach higher joint outcomes when at least one member has low personal need for structure (i.e., high epistemic motivation) than when both members have high personal need for structure (Hypothesis 1). To test this hypothesis, we performed an ANOVA (Welch
F to correct for unequal group size, cf. Tomarken & Serlin, 1986) with one
independent variable (dyad composition: both low vs. mixed vs. both high) on joint
outcomes, which revealed the expected significant main effect, \( F(2, 28.31) = 8.39, p < .01, \eta^2 = .22 \). Dyads in which both members had high personal need for structure
reached lower joint outcomes (\( M = 520.00, SD = 40.27 \)) than mixed dyads (\( M =
566.96, SD = 35.98, t(26.64) = 4.13, p < .01 \)) or dyads in which both members had
low personal need for structure (\( M = 550.00, SD = 41.31, t(25.97) = 2.24, p < .05 \).
The difference between mixed dyads and dyads in which both members had low
personal need for structure was not significant, \( t(29.42) = 1.33, ns \). This pattern of
results supports Hypothesis 1.

In addition, we performed an ANOVA on outcome difference, which
revealed no effects, \( F(2, 28.31) < 1, ns \).

Discussion and Introduction to Experiment 3.2

Results of the first experiment support Hypothesis 1: Dyads in which at
least one member has high epistemic motivation reach higher joint outcomes than
dyads in which no member has high epistemic motivation. A limitation of
Experiment 3.1 is that epistemic motivation was measured rather than manipulated,
thus providing correlational rather than causal evidence for our theory. Therefore,
the first objective of Experiment 3.2 was to expand the findings of Experiment 3.1
in a context where epistemic motivation was induced rather than measured. As was
mentioned in the introduction, epistemic motivation was manipulated by making
some negotiators (within a pair) process accountable or not. We expected to replicate
the pattern of results for joint outcomes obtained in Experiment 3.1, and such
replication would lend further confidence in the generalizability of the current
results.

Because participants in Experiment 3.1 did not know their counterpart's
preferences and priorities (they were not shown these prior to the negotiation), high
joint outcomes must have been due to specific (combinations of) processes that
emerge during negotiation. Two such processes seem relevant here. A first possibility
is that negotiators with high epistemic motivation search and provide information,
subsequently process this information and share the emerging insight by proposing
mutually beneficial, integrative solutions. This is in line with previous research, which
not only showed that epistemic motivation affects information processing (e.g., De
Dreu et al., 1999; Kruglanski & Webster, 1996), but also suggests that when
individuals with high epistemic motivation lack relevant information about the task
they actively search for it (e.g., Chaiken & Trope, 1999). In an interpersonal context
such as negotiation, one way to attain the necessary information is to ask one's
counterpart for it. Indeed, preliminary support for this assumption can be found in
findings of Thompson (1991; Exp.2) who found that the dyad as a whole benefited and obtained better collective outcomes when at least one negotiator either asked or sought information. Thus, one could predict that negotiators with high epistemic motivation who lack information about the counterpart’s preferences engage in active information search, and ask their counterpart for information about his or her preferences and priorities.

However, an alternative possibility is suggested by work on antecedents of joint benefit in bilateral negotiation and bargaining (e.g., Kelley & Schenitzki, 1972; Pruitt & Lewis, 1975; Schulz & Pruitt, 1978). Pruitt and Lewis (1975) found that high joint benefit could be obtained through either information exchange about preference and priorities, or heuristic trial and error. Through offer-based tactics such as single-issue offers (Pruitt & Lewis, 1975) and small, systematic concessions (Kelley & Schenitzki, 1972), negotiators seek the counterpart’s reaction to their offer, and consequently attain information about their counterpart. In addition, research has shown that negotiators tend to reciprocate the provision of information (Pruitt & Carnevale, 1993; Thompson, 1991). Thus, through the use of offer-counteroffer behaviors negotiators might be able to obtain agreements without the risk of divulging too much information, thereby avoiding the so-called "information dilemma" (Murnighan, Babcock, Thompson, & Pillutla, 1999). Thus, it may be that when negotiators lack information about the counterpart’s preferences and priorities, i.e., the default situation in negotiation, those with high epistemic motivation engage in more heuristic trial and error offer-generation, which will consequently be reciprocated by the counterpart and may result in high joint outcomes.

To better understand the process through which high epistemic motivation leads to more integrative agreements, in Experiment 3.2 it was manipulated whether negotiators had, or did not have, information available about their counterpart’s preferences and priorities. In general, one would expect negotiating pairs with full information about each other’s payoffs to achieve higher joint outcomes than those pairs in which only information about own payoffs is provided (Hypothesis 2). However, our information-exchange reasoning suggests that dyads that lack information about their counterpart’s preferences and priorities engage in information search especially when at least one member has high epistemic motivation (Hypothesis 3) and that, therefore, pairs with at least one member with high epistemic motivation achieve higher joint outcomes than dyads in which both members have low epistemic motivation (Hypothesis 4). Our alternative trial-and-error reasoning, however, suggests that dyads that lack information about their counterpart’s preferences and priorities engage in heuristic trial-and-error especially when at least one member has high epistemic motivation (Hypothesis 5), and therefore achieve high joint outcomes (Hypothesis 6). Thus, we expected effects of
epistemic motivation especially when incomplete rather than complete information is provided, because it was expected that pairs with at least one negotiator with high epistemic motivation would overcome their information sufficiency by either information search (Hypotheses 3 and 4) or trial and error (Hypotheses 5 and 6) in the incomplete information condition. We therefore coded behavior during the negotiation to assess whether these effects of epistemic motivation on integrative agreement are due to information exchange, heuristic trial-and-error, or perhaps both.

Method

Participants and Design

One hundred and sixty-six students from the University of Amsterdam (47 men, ̅X = 20.75 years), randomly assigned to 83 dyads, participated in the experiment. Participants either received course credit, or were paid (10 Euro; approximately 12 US$). Dyads differed in gender composition and average age, but because no direct or indirect effects on the dependent variables were observed, this is not discussed further. The design was a 2 x 3 factorial, with epistemic motivation at the dyad level (both members high vs. mixed vs. both members low) and preference information (incomplete [own profit schedule] vs. complete [own and other's profit schedule]) as the between-dyad independent variables. Dependent variables were joint outcomes, information processing, information search, urgency statements, procedural statements, lying, threats and offers made (both single- and multi-issue).

Negotiation Task

The task was highly similar to the one used in Experiment 3.1, and was an adaptation of a task used in previous research (De Dreu et al., 2006; Pruitt & Lewis, 1975). Pairs of participants took on the role of union or management representatives who had to reach agreement on five issues: Salary, start date, duration of the contract, annual raise, and medical coverage. For salary, start date and annual raise there were seven alternatives on which negotiators could agree. For duration of contract and medical coverage there were five alternatives on which negotiators could agree. Each negotiator received a schedule that gave information about his or her profits.

The task consisted of four integrative issues (start date, duration of contract, annual raise and medical coverage), and one distributive issue (salary). By logrolling (giving up on less valuable issues to maximize outcomes on the most valuable issue) negotiators were able to integrate their interests. The maximum individual outcome per negotiator was 1290 points. An integrative agreement (that is, an agreement that maximizes joint outcomes, e.g., €17000 salary, 2 weeks start date, 0.5 years duration
of contract, 1% annual raise and 50% medical coverage) yielded a total of 1620 points, see also Table 3.2.

Table 3.2
Profit Schedules for the Management and Union Representative (Experiment 3.2)

<table>
<thead>
<tr>
<th>Management</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Salary</td>
<td>Start Date</td>
<td>Duration of Contract</td>
<td>Annual Raise</td>
<td>Medical Coverage</td>
</tr>
<tr>
<td>€14,000 (540)</td>
<td>14 weeks (90)</td>
<td>0.5 year (180)</td>
<td>1% (360)</td>
<td>10% (120)</td>
</tr>
<tr>
<td>€15,000 (450)</td>
<td>12 weeks (75)</td>
<td>1.0 year (135)</td>
<td>2% (300)</td>
<td>20% (90)</td>
</tr>
<tr>
<td>€16,000 (360)</td>
<td>10 weeks (60)</td>
<td>1.5 year (90)</td>
<td>3% (240)</td>
<td>30% (60)</td>
</tr>
<tr>
<td>€17,000 (270)</td>
<td>8 weeks (45)</td>
<td>2.0 year (45)</td>
<td>4% (180)</td>
<td>40% (30)</td>
</tr>
<tr>
<td>€18,000 (180)</td>
<td>6 weeks (30)</td>
<td>2.5 year (00)</td>
<td>5% (120)</td>
<td>50% (00)</td>
</tr>
<tr>
<td>€19,000 (90)</td>
<td>4 weeks (15)</td>
<td></td>
<td></td>
<td>6% (60)</td>
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<td>€20,000 (00)</td>
<td>2 weeks (00)</td>
<td></td>
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<td>7% (00)</td>
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<thead>
<tr>
<th>Union</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>€14,000 (00)</td>
<td>14 weeks (00)</td>
<td></td>
<td></td>
<td>1% (00)</td>
</tr>
</tbody>
</table>

*Note.* Numbers in brackets refer to points earned by the participant.

**Procedure**

Upon arrival in the laboratory, participants were randomly assigned to roles of a management and a union representative and were seated in separate cubicles in front of a computer. All instructions were presented to them on the computer screen, with the exception of their profit schedule, which they received on paper so they could consult it during the negotiation. Participants read that they were about to participate in a computer-mediated negotiation, and they could negotiate for maximally 35 minutes. Participants were further instructed that failure to reach agreement would result in zero points. To make sure that participants understood
their profit schedule, we gave them a short quiz. After reading their instructions, participants negotiated using a chat program. When they reached an agreement, or when their 35 minutes ran out, they were asked to write down the amount of points they achieved and completed a post-negotiation questionnaire containing manipulation check and information processing items (see below).

**Manipulation of Epistemic Motivation and Information**

Epistemic motivation was induced through process accountability by providing participants with instructions (cf. De Dreu et al, 2006; Scholten, Van Knippenberg, Nijstad, & De Dreu, 2007). Process accountability can be described as the implicit or explicit expectation that one has to account for one's actions and the ways in which judgments and decisions were reached (Lerner & Tetlock, 1999). Thus, one important element of process accountability is that one expects one's behavior or the process through which a decision was reached to be assessed, and this leads to systematic, effortful information processing (e.g., Kruglanski & Freund, 1983; Siegel-Jacobs & Yates, 1996; Simonson & Staw, 1992). Participants' level of epistemic motivation was manipulated by inducing different levels of process accountability: High vs. low. Participants in the high epistemic motivation condition received a special memo explaining that, after the study, they would be quizzed about "the ways you negotiated, the decisions you made and the way the negotiation unfolded", and that "Previous participants have indicated that they found the quiz quite difficult". In contrast, participants in the low epistemic motivation condition were told that "Previous participants have indicated that they found the quiz quite easy". All participants were told that they should prepare themselves as well as possible and were allowed to take notes during the negotiation. Thus, the critical difference in the manipulation concerned the expected difficulty of the quiz.

To manipulate the amount of information about their counterpart's preferences and priorities, half of the participants were provided with the counterpart's pay-off schedule. Members of dyads in the incomplete information condition were provided with their own profit schedule, which they could keep with them during the negotiation. They were not given any information about the counterpart's preferences, but were told that they could talk about anything they wanted, including their profit schedules. Members of dyads in the complete information condition were first provided with their own profit schedule, which they could keep with them during the negotiation, and in addition were provided with the profit schedule of the counterpart, which appeared on their computer screen for two minutes.

**Dependent Variables**

*Manipulation checks.* To check the adequacy of the manipulation of epistemic motivation, a 3-item questionnaire was used (e.g., "I believe that the quiz I'm about
to participate in, is difficult"). To check the adequacy of the manipulation of
information, we used a two-item questionnaire (e.g., "Before we started negotiating
... I knew the other party's payoffs"). Answers could be given on five-point scales (1
= disagree and 5 = agree). Scores were averaged over the three and two items,
respectively, and both scales proved reliable (Cronbach's \( \alpha > .65 \)).

As an additional check for the manipulation of epistemic motivation
information processing was measured using two items (cf. De Dreu et al., 2006): "I
tried to make judgments and decisions as thoroughly as possible" and "I thought
deeply before making a decision". Answers could be given on a five-point scale, with
1 = disagree and 5 = agree. Scores were averaged over the two items, and the scale
for information processing proved reliable (Cronbach's \( \alpha = .80 \)).

Coding of behavioral data. Participants communicated using a chat program.
Their written transcripts were coded, using (parts of) a coding scheme used in
previous research (e.g., Weingart, Hyder, & Prietula, 1996). Information search was
coded by counting the number of questions negotiators asked their counterpart
about his or her preferences and priorities. Heuristic trial and error was coded by
counting the number of single-issue offers both parties made. To assess negotiators'
understanding of the integrative solution the number of multi-issue offers was counted.
Both multi-issue offers that were in the direction of the integrative agreements and
multi-issue offers that were not in the direction of the integrative agreement were
coded. Multi-issue offers that were in the direction of the integrative agreement, i.e.
Salary 17,000, Start date 6 weeks, Duration of contract 1 year, Annual raise 1%, and
Medical coverage 40% were thus indicative of the amount of integrative trade-offs
participants made, as opposed to multi-issue offers that were not in the direction of
the integrative agreement, i.e., Salary 14,000, Start date 12 weeks, Duration of
contract 1 year, Annual raise 2%, and Medical coverage 20%. Finally, urgency statements
(statements intended to rush the other party), procedural statements (statements directed
at establishing a procedure for decision making), and threats were coded.

The unit of analysis was speaking turns, and as in earlier research we
calculated the ratio for the specific behaviors that were coded by dividing their
frequencies by the total number of speaking turns (cf. Weingart et al., 1996). One
coder, who was blind to the hypotheses and the different experimental conditions,
coded all transcripts. In addition, to assess interrater agreement, another coder coded
ten percent of the transcripts. Interrater reliability proved to be good, Cohen's \( \kappa = .71 \) (cf. Cohen, 1960). Thus, we used the first coder's ratings. Because individual
observations within one dyad were not independent, we used the dyad as the unit of
analysis, and therefore we aggregated the behaviors of the two dyad members.

Joint outcomes. Joint outcomes were calculated by summing the individual
outcomes of the two dyad members. The lowest possible joint outcomes were zero
points (when a dyad failed to reach agreement), and the highest possible joint outcomes were 1620 points. In addition, the absolute difference between both negotiators’ outcomes was calculated to investigate asymmetry in outcomes, as was done in Experiment 3.1.

Results

Descriptive statistics

Table 3.3 shows the correlations, means and standard deviations of all coded process variables. Several things are noteworthy. First, Table 3.3 shows a positive and significant correlation between information search and integrative multi-issue offers, indicating a positive relationship between the amount of information search and insight into the negotiation structure, as coded by integrative multi-issue offers. Second, the more single-issue offers negotiators made, they less they engaged in information search, and the less integrative multi-issue offers they made. Furthermore, the amount of urgency statements was positively related to non-integrative multi-issue offers and threats, and negatively related to procedural statements. Finally, procedural statements were negatively related to threats. In sum, these correlations show that statements directed at obtaining a high quality agreement such as information search, relate positively to behaviors directed at obtaining integrative agreements, such as integrative multi-issue offers. Conversely, threats were positively related to statements associated with distributive outcomes, such as urgency statements.
Table 3.3
Means, Standard Deviations and Correlations of all coded dependent variables (Experiment 3.2)

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>$\delta$</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Information Search</td>
<td>0.029</td>
<td>0.036</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>2. Multi-issue offers (integ.)</td>
<td>0.049</td>
<td>0.045</td>
<td>.27$^*$</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>3. Multi-issue offers (noninteg.)</td>
<td>0.030</td>
<td>0.039</td>
<td>-.18</td>
<td>-.10</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>4. Single-issue offers</td>
<td>0.133</td>
<td>0.099</td>
<td>-.32$^*$</td>
<td>-.24$^*$</td>
<td>-.09</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>5. Urgency Statements</td>
<td>0.011</td>
<td>0.016</td>
<td>-.09</td>
<td>-.05</td>
<td>.23$^*$</td>
<td>-.11</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>6. Procedural Statements</td>
<td>0.069</td>
<td>0.037</td>
<td>-.15</td>
<td>-.14</td>
<td>-.16</td>
<td>-.01</td>
<td>-.19$^+$</td>
<td>--</td>
</tr>
<tr>
<td>7. Threats</td>
<td>0.003</td>
<td>0.009</td>
<td>-.03</td>
<td>-.04</td>
<td>.21$^*$</td>
<td>-.06</td>
<td>.24$^*$</td>
<td>-.27$^*$</td>
</tr>
</tbody>
</table>

Note. $N = 83$, $^* p < .01$, $^+ p < .05$, $^+ p < .10$
**Manipulation checks**

Because epistemic motivation and preference information were manipulated at the individual level (i.e., dyad members could differ in their epistemic motivation manipulation), we assessed whether the manipulations were successful at the individual, rather than the dyad level. A 2 (epistemic motivation: high vs. low) by 2 (preference information: complete vs. incomplete) Analysis of Variance showed a main effect of epistemic motivation on the manipulation check for epistemic motivation, $F(1, 162) = 145.17, p < .001, \eta^2 = .47$. Inspection of the means revealed that the manipulation was successful: Negotiators with high epistemic motivation scored higher on the manipulation check ($M = 3.81, SD = 0.94$), than negotiators with low epistemic motivation ($M = 2.28, SD = 0.67$). The same analysis revealed a significant main effect of preference information on the manipulation check for information, $F(1, 162) = 167.01, p < .001, \eta^2 = .51$, indicating that the manipulation was successful ($M_{\text{comp}} = 4.24, SD = 0.96$ vs. $M_{\text{incomp}} = 2.42, SD = 1.15$). No other effects were significant.

To complement these manipulation check data, information processing was assessed. We conducted a 2 (epistemic motivation: high vs. low) by 2 (preference information: complete vs. incomplete) Analysis of Variance, which showed the expected main effect of epistemic motivation, $F(1, 162) = 10.11, p < .01, \eta^2 = .06$: Negotiators with high epistemic motivation engaged in more information processing ($M = 3.99, SD = 0.67$) than negotiators with low epistemic motivation ($M = 3.64, SD = 0.78$). No other effects were significant.

**Joint Outcomes**

Hypothesis 2 predicted that dyads in the complete information condition would reach higher joint outcomes than dyads in the incomplete information condition. A 3 (epistemic motivation of dyad: both members high vs. mixed vs. both members low) by 2 (information: complete vs. incomplete) ANOVA on joint outcomes revealed the expected trend: Dyads reached higher joint outcomes in the full information condition ($M = 1402.32, SD = 157.93$) than dyads in the incomplete information condition ($M = 1337.14, SD = 172.14$). $F(1, 77) = 3.75, p = .057, \eta^2 = .05$. Furthermore, the same analysis revealed a significant main effect of epistemic motivation, $F(2, 77) = 3.56, p < .05, \eta^2 = .09$. Consistent with results reported in Experiment 3.1, dyads in which both members had low epistemic motivation achieved lower joint outcomes ($M = 1287.86, SD = 220.72$) than dyads in which both members had high epistemic motivation ($M = 1392.14, SD = 157.22$, $t(77) = 2.08, p < .05$) or mixed dyads ($M = 1399.39, SD = 127.38$, $t(77) = 2.56, p = .01$). The difference between mixed dyads and dyads with high epistemic motivation was not significant, $t(77) < 1$, ns.
Both main effects were qualified by a significant interaction between motivation and information, \( F(2, 77) = 3.38, p < .05, \eta^2 = .08 \), see Table 3.4. As can be seen in Figure 3.1, simple effects analysis revealed that for dyads in the complete information condition, epistemic motivation did not have a significant effect on joint outcomes, \( F(2, 77) < 1, ns \). For dyads in the incomplete information condition however, ANOVA revealed a significant simple main effect of epistemic motivation, \( F(2, 77) = 6.77, p < .01, \eta^2 = .15 \). Dyads with low epistemic motivation reached lower joint outcomes (\( M = 1190.46, SD = 233.76 \)) than either mixed dyads (\( M = 1377.86, SD = 108.40, t(77) = 3.27, p < .01 \)) or dyads with high epistemic motivation (\( M = 1413.00, SD = 109.95, t(77) = 3.23, p < .01 \)). The difference between mixed dyads and dyads in which both members had high epistemic motivation was not significant, \( t(77) < 1, ns \). Thus, Hypothesis 3 was confirmed.

![Figure 3.1](image)

*Figure 3.1. Joint outcomes as a function of dyads’ epistemic motivation composition and preference information (Experiment 3.2).*

To investigate the assumption that high epistemic motivation would help negotiators overcome their lack of information, we contrasted low epistemic motivation dyads in the complete information condition with dyads in the incomplete information condition in which at least one of the members had high epistemic motivation. Results of the contrast analysis revealed, first of all, the same omnibus interaction on joint outcomes as described above, \( F(2, 77) = 3.38, p < .05, \eta^2 = .08 \). Planned contrasts revealed no significant difference between the complete
information, low epistemic motivation dyads ($M = 1395.00$, $SD = 152.32$) and incomplete information, high epistemic dyads ($M = 1413.00$, $SD = 109.95$), $t(77) < 1$, $ns$, and no significant difference between the complete information, low epistemic motivation dyads and incomplete information, mixed epistemic dyads ($M = 1377.86$, $SD = 108.40$), $t(77) < 1$, $ns$. Thus, it appeared that high epistemic motivation enabled dyads in the incomplete information condition to overcome their lack of information and to reach high joint outcomes.

In addition to the analyses on joint outcomes, we conducted a 3 (epistemic motivation: both members high vs. mixed vs. both members low) x 2 (information: incomplete vs. complete) ANOVA on outcome difference, which revealed no significant effects.

Table 3.4  
Information Search and Joint Outcomes as a Function of Epistemic Motivation of the Dyad and Preference Information (Experiment 3.2).

<table>
<thead>
<tr>
<th>Preference Information</th>
<th>Incomplete</th>
<th>Complete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epistemic motivation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Both high</td>
<td>(n = 10)</td>
<td>(n = 21)</td>
</tr>
<tr>
<td>Mixed</td>
<td>(n = 11)</td>
<td>(n = 11)</td>
</tr>
<tr>
<td>Both low</td>
<td>(n = 11)</td>
<td>(n = 20)</td>
</tr>
<tr>
<td>Mixed</td>
<td>(n = 10)</td>
<td>(n = 10)</td>
</tr>
<tr>
<td>1. Information Search</td>
<td>0.06a</td>
<td>0.04b</td>
</tr>
<tr>
<td>(0.06)</td>
<td>(0.03)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>2. Joint Outcomes</td>
<td>1413.00</td>
<td>1377.86c</td>
</tr>
<tr>
<td>(109.95)</td>
<td>(108.40)</td>
<td>(220.72)</td>
</tr>
<tr>
<td></td>
<td>1287.86c</td>
<td>(194.23)</td>
</tr>
<tr>
<td></td>
<td>1373.18c</td>
<td>(144.01)</td>
</tr>
<tr>
<td></td>
<td>1422.00b</td>
<td>(152.32)</td>
</tr>
<tr>
<td></td>
<td>1395.00b</td>
<td></td>
</tr>
</tbody>
</table>

Note. Standard deviations are given in brackets. Means not sharing the same subscript per row differ at $p < .05$.

Coded Negotiation Process

Information Search. To test Hypothesis 3, we conducted a 3 (epistemic motivation: both members high vs. mixed vs. both members low) x 2 (information: incomplete vs. complete) ANOVA on the amount of information search which revealed, first of all, a tendency for dyads in the incomplete information condition to engage in more information search ($M = 0.04$, $SD = 0.04$) than dyads in the complete information condition ($M = 0.02$, $SD = 0.03$), $F(1, 77) = 3.70, p = .058, \eta^2 = .05$. This trend was qualified by a significant interaction between epistemic motivation and preference information, $F(2, 77) = 3.29, p < .05, \eta^2 = .08$, see Table 3.3. Simple effects analysis revealed a main effect of epistemic motivation for dyads
in the incomplete information condition, \( F(2, 77) = 3.79, p < .05, \eta^2 = .09 \), indicating that dyads in which both members had low epistemic motivation engaged in less information search (\( M = 0.02, SD = 0.03 \)) than mixed (\( M = 0.04, SD = 0.03 \), \( t(77) = 1.72, p < .09 \)) or high epistemic motivation dyads (\( M = 0.06, SD = 0.06 \), \( t(77) = 2.74, p < .01 \)). Mixed and high epistemic motivation dyads did not differ significantly, \( t < 1, ns \). For dyads in the complete information condition, this simple main effect was not significant, \( F(2, 77) < 1, ns \). Thus, Hypothesis 3 was confirmed.

We conducted mediation analysis to analyze whether the effects we found on joint outcomes were mediated by the amount of information search. According to Baron and Kenny (1986), mediation is established when four conditions are met. First, the independent variable should influence the dependent variable. This condition was met when results revealed a significant interaction of epistemic motivation and information on joint outcomes (see Table 3.3). Second, the independent variable should influence the mediator variable. This condition was met for information search in Hypothesis 3 (see also Table 3.3). Third, the mediator variable should have an effect on the dependent variable. This condition was met as well – regression analysis revealed a significant effect of information search on joint outcomes, \( \beta = 0.31, p < .01 \). Fourth, the effect of the independent variable on the dependent variable should be reduced when the mediator variable is controlled for. Regression analysis showed this to be the case indeed, \( \beta = -0.19, p = .07 \), and a Sobel test showed that this reduction in regression weight approached significance, \( z = 1.91, p = .055 \). Thus, as predicted, the interaction between epistemic motivation and preference information on joint outcomes was mediated by the amount of information search dyads engaged in.

**Heuristic Trial-and-Error.** To test Hypothesis 5, we conducted a 3 (epistemic motivation: both members high vs. mixed vs. both members low) x 2 (information: incomplete vs. complete) ANOVA on the amount of single-issue offers made. Results showed that the amount of single-issue offers did not differ as a result of the interaction between epistemic motivation and information, \( F(2, 77) < 1, ns \). No other effects were significant. Thus, Hypothesis 5 was not supported. We did not proceed with testing the mediator Hypothesis 6, because it requires Hypothesis 5 to be supported.

**Multi-issue offers – difference integrative vs. non-integrative.** A 3 (epistemic motivation) x 2 (information) x 2 (multi-issue offers) ANOVA with epistemic motivation and information as the between-subjects variables and multi-issues (integrative multi-issue offers vs. non-integrative multi-issue offers) as a within-subjects variable revealed an interaction between epistemic motivation and the within-subject factor multi-issues, \( F(2, 77) = 7.97, p < .01, \eta^2 = .17 \). Further analysis revealed that dyads made more integrative multi-issue offers (\( M = 0.043, SD = \)
0.044) than non-integrative multi-issue offers \((M = 0.017, SD = 0.037)\), but only when they had high epistemic motivation, \(F(1, 77) = 4.38, p < .05\). When dyads had low epistemic motivation, they made more non-integrative multi-issue offers \((M = 0.049, SD = 0.044)\) than integrative multi-issue offers \((M = 0.008, SD = 0.020)\), \(F(1, 77) = 10.76, p < .01\). For dyads in the mixed condition, the difference was not significant \((M = 0.034, SD = 0.051)\), for integrative multi-issue offers and \(M = 0.026, SD = 0.035\), for non-integrative multi-issue offers, respectively, \(F(1, 77) < 1, ns\).

**Other Negotiation Behavior.**

*Urgency statements.* A 3 x 2 ANOVA revealed, first of all, a significant main effect of epistemic motivation, \(F(2, 77) = 6.79, p < .05, \eta^2 = .15\). Dyads in the low epistemic motivation condition made more statements intended to hurry their counterpart \((M = 0.021, SD = 0.021)\) than dyads in the mixed \((M = 0.007, SD = 0.012, t(77) = 2.84, p < .01)\) or high epistemic motivation condition \((M = 0.008, SD = 0.012, t(77) = 2.56, p < .05)\). Furthermore, ANOVA revealed a significant interaction between epistemic motivation and information, \(F(2, 77) = 3.95, p < .05, \eta^2 = .09\). Simple effects revealed that for dyads in the full information condition, epistemic motivation did not have a significant effect, \(F(2, 77) = 1.08, ns\). For dyads in the incomplete information condition, ANOVA revealed a significant simple main effect for epistemic motivation, \(F(2, 77) = 4.60, p < .05, \eta^2 = .10\). Members of dyads with low epistemic motivation made more statements intended to hurry their counterpart \((M = 0.028, SD = 0.024)\) than dyads in the mixed \((M = 0.010, SD = 0.013, t(77) = 2.39, p < .05)\) or high epistemic motivation condition \((M = 0.003, SD = 0.005, t(77) = 3.38, p < .01)\). The difference between mixed dyads and high epistemic dyads was also significant, \(t(77) = 2.01, p = .05\).

*Procedural statements.* A 3 x 2 ANOVA revealed a significant main effect for epistemic motivation on procedural statement, \(F(2, 77) = 4.67, p < .05, \eta^2 = .11\). Members of dyads in the low epistemic motivation condition made less procedural statements \((M = 0.05, SD = 0.03)\) than dyads in the mixed \((M = 0.07, SD = 0.04, t(77) = 2.19, p < .05)\) or high epistemic motivation condition \((M = 0.08, SD = 0.04, t(77) = 3.00, p < .05)\). The difference between dyads in the mixed and high epistemic motivation condition was not significant, \(t(77) = 1.26, ns\).

*Lying.* A 3 x 2 ANOVA revealed a significant main effect for information on lying, \(F(1, 77) = 5.92, \eta^2 = .07\). Dyads in the incomplete information condition engaged in more lying \((M = 0.013, SD = 0.03)\) than dyads in the complete information condition \((M = 0.002, SD = 0.007)\).

*Threats.* A 3 (epistemic motivation: both members high vs. mixed vs. both members low) x 2 (information: incomplete vs. complete) ANOVA on the amount of threats revealed a significant main effect of epistemic motivation, \(F(2, 77) = 3.03, p = .05, \eta^2 = .07\). Inspection of means showed that dyads in the low epistemic
motivation condition made more threats \( M = 0.007, SD = 0.015 \) than dyads in the mixed \( M = 0.001, SD = 0.004, t(77) = 1.67, p < .05 \) or high epistemic motivation condition \( M = 0.002, SD = 0.005, t(77) = 2.44, p < .05 \). No other differences were significant.

**Discussion**

Experiment 3.2 replicated the findings of Experiment 3.1 and extended the findings to settings in which epistemic motivation is situationally induced, as opposed to measured. Our results revealed that the presence of at least one negotiator with high epistemic motivation helped dyads overcome their lack of information. Furthermore, our analysis of process data revealed the essential mediating process of information search. Dyads in the incomplete information condition achieved higher joint outcomes when at least one negotiator had high epistemic motivation, and this was due to an increase in information search.

Our additional analysis of the process data yielded several noteworthy effects. First of all, the analysis revealed that when dyads had low epistemic motivation, more urgency statements intended to rush the other party were made, more threats were made, and more non-integrative multi-issue offers were made than in dyads in which at least one member had high epistemic motivation. Second, and conversely, negotiators in dyads in which at least one negotiator had high epistemic motivation made more integrative multi-issue offers and made more procedural statements than negotiators in dyads in which both members had low epistemic motivation. Finally, dyads in which both members had high epistemic motivation made more integrative multi-issue offers than non-integrative multi-issue offers, while negotiators in low epistemic motivation dyads made more non-integrative multi-issue offers than integrative multi-issue offers.

**Conclusions and General Discussion**

Because negotiation is taxing and difficult, and because negotiators face an ambiguous situation with lots of unknowns and many uncertainties, they often rely on simplifying heuristics, and pre-existing cognitive structures (Pruitt & Carnevale, 1993). While efficient, such heuristic information processing entails the risk of biased judgment and decision-making, thereby reducing the chance of reaching mutually beneficial, integrative agreements. Recent work on motivated information processing has, however, shown that features of the situation may raise negotiators’ epistemic motivation and lead to more thorough, deliberate and systematic information processing. When this happens, negotiators are more likely to uncover integrative potential, and to reach mutually beneficial agreements. Thus, high levels of epistemic
motivation serve as the antidote to shallow decision-making and sub-optimal negotiation agreements.

While several studies showed support for the motivated information processing perspective (for reviews see De Dreu & Carnevale, 2003; De Dreu et al., 2006), a number of issues remained unclear. Despite the fact that in many situations some negotiators have high and others have low epistemic motivation, past work implicitly or explicitly assumed homogeneity in epistemic motivation - all members share the same low or high level of motivation. The current set of studies were concerned with heterogeneity, and addressed situations in which one member of a dyad has high, and the other member has low epistemic motivation. In the next section, we will discuss the results in more detail and will offer suggestions for future research.

_Theoretical implications and Avenues for Future Research_

The current work expands the motivated information processing model (De Dreu & Carnevale, 2003) and contributes to our understanding of diversity in epistemic motivation in negotiation. Past research concerned with epistemic motivation has shown the beneficial effects of high epistemic motivation at the individual (e.g., De Dreu et al., 1999), the dyadic (e.g., De Dreu, Koole et al., 2000) and at the group level (e.g., De Grada et al., 1999). Unfortunately, the study of epistemic motivation at the dyadic and group-level has been limited to homogeneous situations, in which all negotiators have the same high or low epistemic motivation. As epistemic motivation can be rooted in individual differences such as need for structure and need for cognitive closure (e.g., Kruglanski & Webster, 1996) as well as situational features (e.g., Tetlock, 1992), studying the effects of heterogeneity of epistemic motivation is relevant from both a theoretical and practical point of view. In two experiments it was revealed that when one member of a pair of negotiators has high epistemic motivation, the collective, that is, the dyad as a whole, benefits from greater information exchange and higher joint outcomes. Experiment 3.1 revealed that when at least one member of a dyad had low need for structure, i.e. when one dyad member had a preference for complexity and spontaneity, and was less likely to rely on heuristics (e.g., Neuberg & Newsom, 1993), the dyad as a whole reached a higher joint outcomes than when both members had high need for structure. In Experiment 3.2 epistemic motivation was manipulated rather than measured, and this effect was replicated: When at least one member of a dyad was process accountable, the dyad as a whole benefited and reached higher joint outcomes. Thus, our conclusion that it requires only one member to have high epistemic motivation appears to hold for individual differences variables like personal need for structure, and for situational variables like process accountability.
In addition, different negotiation tasks were used. Despite these differences in setting highly similar results were obtained, which suggests that effects of group composition in epistemic motivation on negotiated agreement is not tied to specific settings or operationalizations.

That one member with high epistemic motivation suffices to bring the pair to a higher level also means that when at least one member of a dyad has high epistemic motivation, the dyad as a whole uses available information in a more beneficial way, thus securing high joint outcomes. In Experiment 3.2 we tested the assumption that high epistemic motivation helps negotiators overcome their lack of information regarding the counterpart's preferences and priorities. Results of Experiment 3.2 supported this assumption. We were specifically interested in how dyads came to high joint outcomes. Past research has revealed two possible routes to success in negotiation: Through exchange of information and thorough processing of information (e.g., De Dreu et al., 1999; Thompson, 1991) or through heuristic trial and error (e.g., Pruitt & Lewis, 1975). Up till now, research on epistemic motivation in negotiation did not test the information exchange about preferences and priorities route vs. the trial-and-error route. Results of the second experiment showed that through information search, and systematic and thorough processing of information, dyads in which at least one member had high epistemic motivation reached higher joint outcomes, rather than through trial and error, offer-counteroffer tactics.

Thus, taken together, the two experiments reported in this chapter make several noteworthy contributions to negotiation theory and more specifically, to the understanding of the effects of epistemic motivation in negotiation. First of all, the current work contributes to our understanding of the precise negotiation processes through which epistemic motivation affects the quality of agreement negotiators reach. In addition to the effects discussed above, Experiment 3.2 revealed several interesting effects that pertain to the more general literature on epistemic motivation. Second, and most importantly, the current research contributes to our knowledge about epistemic motivation composition by showing that dyads in which at least one member has high epistemic motivation engage in more information search, information processing and consequently reach higher joint outcomes than dyads in which both members have low epistemic motivation.

The fact that predictions were tested in two studies with students as participants could raise questions about generalizability. Considering the nature of the research question, with individual level (epistemic motivation) and dyad level (information) variables as predictors of negotiation outcomes, and our investigation of the processes that took place during the negotiation, it would have been very difficult, if not impossible, to conduct the same studies in a real-life setting. Furthermore, we believe that the current research had "experimental realism"
(Berkowitz & Donnerstein, 1982; Dipboye, 1990). In the debriefings participants indicated that they found the task psychologically engaging and involving. Finally, the current findings were consistent over two different settings, in which communication took place face-to-face (Experiment 3.1) or by the use of a chat program (Experiment 3.2). Given this consistency we are confident our findings generalize beyond laboratory settings. Nevertheless, future research is needed to examine whether current conclusions also pertain to dyads in applied settings where negotiators are familiar with each other and have experience with negotiation, such as work organizations.

An interesting question that remains is how heterogeneity of epistemic motivation would affect negotiation processes in outcomes in larger groups, when for example a minority of group members has high epistemic motivation and a majority has low epistemic motivation. It would be an interesting avenue for future research to investigate whether the finding that it takes one member with high epistemic motivation to benefit the dyad as a whole would also mean that it would take one member with high epistemic motivation to benefit the group as a whole. Research on heterogeneity of social motivation in three-person negotiating groups has shown that group composition interacts with the decision rule group members use (Ten Velden, Beersma, & De Dreu, 2007b). When using unanimity rule, the beneficial effect of a group member with high epistemic motivation might be more pronounced than when groups use majority rule, and the two members with low epistemic motivation may dictate the terms of the negotiated decision.

Finally, the current research provides support for the so-called information sufficiency principle (i.e., individuals with high epistemic motivation might have higher information sufficiency thresholds which encourages them to engage in more information search; Chaiken & Trope, 1999; Scholten et al., 2007). When negotiators had low epistemic motivation, they made more urgency statements than when they had high epistemic motivation, which suggests that negotiators with low epistemic motivation were less concerned with whether the amount of information they had was sufficient to reach a high quality agreement. Future research should examine whether indeed negotiators with high epistemic motivation have higher sufficiency thresholds which would encourage them to engage in information search.

**Conclusion**

In two experiments, the effect of epistemic motivation composition in dyads was investigated. The results showed that when one dyad member had high epistemic motivation, dyads engaged in more information search when preference information was lacking. Furthermore, dyads processed information more thoroughly, and showed greater insight into the integrative potential of the
negotiation problem at hand. As a result, dyads in which at least one member had high epistemic motivation reached higher quality decisions than dyads in which both members had low epistemic motivation.
Notes

1This chapter is based on Ten Velden, Beersma, and De Dreu (2007a).
2Related, but less closely connected to Need for Structure is Need for Cognition – an individual’s desire for effortful, elaborative thought (Cacioppo, Petty, Feinstein, & Jarvis, 1996). Need for Structure has a correlation of -.23 with Need for Cognition, and between -.20 and -.23 with General Intelligence (Neuberg & Newsom, 1993). Similarly, Cognitive Complexity (Streufert & Driver, 1967), a dispositional tendency to form more impressions of a situation, has a correlation of between -.48 and -.73 with Need for Structure (Neuberg & Newsom, 1993).
3A regression analysis with both negotiators’ personal need for structure as two continuous independent variables and joint outcomes as the dependent variable yielded similar results and identical conclusions.
4Assigning an outcome of 0 points to dyads that failed to reach agreement can produce heterogeneity of variance (Pruitt & Lewis, 1975). One way to deal with this is to assign impasse dyads with the outcome of agreement that yielded the least amount of points (960 points), following a procedure established in prior research (e.g., Kimmel, Pruitt, Magenau, Konar-Goldband, & Carnevale, 1980; Lewis & Fry, 1977). However, assigning a score of 0 points to dyads that failed to reach agreement produced similar results and identical conclusions, F (2, 77) = 7.13, p < .01, η² = .16 for the main effect of epistemic motivation, F (1, 77) = 6.08, p < .05, η² = .07 for the main effect of preference information, and F (2, 77) = 8.33, p < .01, η² = .18 for the interaction between epistemic motivation and preference information.
5In addition to the individual level analysis, we computed the mean score for each dyad to analyze the data at the dyadic level. A 3 (both members high epistemic motivation vs. one member high, one member low vs. both members low) by 2 (information: full vs. incomplete) ANOVA on the manipulation check for epistemic motivation revealed a significant main effect of epistemic motivation, F (2, 77) = 36.70, p < .001, η² = .49, indicating that dyads in which both members had high epistemic motivation scored higher on the manipulation check (M = 3.76, SD = 0.69) than dyads in which one (M = 3.10, SD = 0.57, t (77) = 3.76, p < .01) or two members (M = 2.23, SD = 0.45, t (77) = 8.40, p < .001) had low epistemic motivation. Also, the difference between one and two members with low epistemic motivation was significant, t (77) = 6.45, p < .001. The same analysis revealed a significant main effect of information on the manipulation check for information, F (1, 77) = 176.19, p < .001, η² = .70. Dyads with full information scored higher (M = 4.21, SD =
0.55) than dyads with incomplete information \( (M = 2.31, SD = 0.64) \). No other effects were significant.