T.R.W. de Wilde
Struggling to decide:  
*Competition in group decision-making*

*Author: T.R.W. de Wilde*

Being the first, the fastest, the smartest, the most handsome, the richest or the strongest. Competition between people is never far away in a society that focuses on pursuing excellence (Shields & Bredemeier, 2009). The main question that I set out to answer in this dissertation was how groups make decisions when there is competition between the group’s members. Specifically, I compared situations in which groups are cooperative vs. competitive in order to examine what effects cooperation and competition have on the way groups exchange and use information and on the quality of decisions that groups make. This is important because – even though competition is an ubiquitous influence in group decision-making – little is known about how competition affects group decisions.

Increasing our understanding of competition during group decision-making will provide insights which organizations, advisors, and teams in general can use to improve their chances of making optimal decisions. Here I will briefly explain what competition in group decision-making entails, followed by an explanation of the importance of information exchange in groups. Next, I describe the general hypothesis of this dissertation, where after I will summarize the main findings of the four empirical chapters in this book, and their implications.

**Theory and predictions**

Often, group decision-making can be characterized as a so-called mixed-motive situation (Schelling, 1980): on the one hand members of a group want or need to reach a joint, collaborative
decision, while on the other hand these same individual group members can be motivated to achieve personal goals. For instance, group members might want to obtain the leadership role within the group, or they might have a vested interest in a decision alternative that they want the group to choose. Such individual goals are competitive in nature, because attainment of these goals depends on other people’s failure to reach the same goal. There can only be one leader of the group and most of the time only one decision alternative can be chosen. Competition thus represents a challenge for decision-making groups, because balancing a collaborative group goal with a more competitive personal goal renders the decision-making process inherently more complex.

Such additional complexity is unfortunate, because even without competition groups have difficulty with exchanging and using all available information (Schulz-Hardt & Mojtisch, 2012). In general, groups spend too much time on information all group members have in common (shared information). Instead, groups should focus more on combining and integrating the unique ideas and viewpoints of each group member (unique information). When groups are biased in favor of shared information, they do not use all the available information, qualities and abilities of their group members. This is striking, because the key reason groups are assigned to complex tasks is that groups can take advantage of a diverse set of ideas. When groups do not take this advantage and, instead, engage in such biased information exchange they will often make unnecessarily poor decisions (Lu et al., 2012).

In this dissertation I identified two main reasons why competition will result in even more biased and ineffective exchange and use of information. First of all, when group members are motivated to outperform other group members, they are less likely to exchange all their information with others because those others might use it to their advantage (see Loschelder et al., 2016; Steinel & De Dreu, 2004). Second, competitive group members are more likely to discuss and process only those bits of
information that are in line with their personal ideas and opinions (so-called preference consistent information), because they experience more ownership over their own ideas (Toma, Bry, et al., 2013; Toma, Gilles, et al., 2013). Based on these two reasons, I have hypothesized throughout this dissertation that competitive groups engage in biased information exchange and processing, and they are therefore more likely to miss out on, or ignore, important pieces of information that are necessary to reach high quality decisions.

This general prediction was tested in six studies which included 417 three-person groups, and are reported in four empirical chapters. These chapters are organized around three main questions that hitherto have remained unanswered:

(1) What is the neurobiological basis of cooperative group decision-making?
(2) How do groups deal with external information, and how is this affected by competition?
(3) How does competition within and between groups affect information exchange and decision-making quality?

**Oxytocin improves cooperative information exchange in groups**

In Chapter 2 I investigated how oxytocin, a hormone and neuropeptide, influences information exchange and use during group decision-making. In doing so I provided first evidence for the neurobiological foundations of groups’ ability to cooperatively work together in a complex decision-making task.

Oxytocin has been linked to the development and regulation of cooperative behaviors in humans and other animals (see Carter, 2014). For instance, oxytocin increases group members’ willingness to invest in their ingroup, even if this comes at a personal cost for the individual group member (De Dreu et al.,
2010; Ten Velden et al., 2016). While oxytocin has been hypothesized to facilitate social interactions, oxytocin has barely been investigated in socially interactive and unconstrained settings, such as highly interactive group decision-making situations. This chapter filled this evidential gap, and reports the findings of a double-blind placebo controlled group decision-making experiment in which groups received either intranasal oxytocin (24 IU; see De Dreu et al., 2010) or placebo. The groups engaged in a so-called hidden profile decision-making task. In this task, some information is shared by all group members and some information is unique for each group member. In order to identify the correct alternative, group members need to exchange all information, in particular those pieces of information that are unique to a single group member.

Based on previous work I argued that oxytocin could either undermine information exchange and decision quality by increasing conformity pressures (see Edelson et al., 2015), or oxytocin could enhance information exchange and decision quality by making group members feel comfortable in exchanging and processing all available information (see Hertz et al., 2016). I found support for the second, but not first prediction: groups who received oxytocin exchanged more unique information and repeated this unique information more often. Thus, oxytocin reduced groups’ bias towards exchanging mostly shared information, which threatens group decision-making in general. Moreover, groups using oxytocin picked the correct decision alternative 26% more often than placebo groups, indicating that oxytocin also enhances decision quality. Finally, I found no evidence that oxytocin increased conformity pressures. On the contrary, exchanging new and unique information is a sign that group members were willing to go against the group’s initial opinion in order to find the best solution. From this I concluded that oxytocin improves information exchange and processing within groups. These findings thus suggest that essential
cooperative group processes, such as unbiased information exchange, have clear neurobiological underpinnings, of which the oxytocin system is an influential example.

**Competition reduces the use of external information**

In Chapter 3 and 4 I examined how groups deal with external information. In order to perform well, groups often need to combine not only their own inputs, but they also need to decide what to do with information that comes from other, external, parties. For example, a team of product developers depends on all the qualities of its team members (e.g., engineering or ergonomics) but also requires input from the market research team in order to get more insight into what customers desire. It remains unclear, however, how groups use external information when making their decisions. In Chapter 3 I examined how groups use external information that is objectively uninformative, while in Chapter 4 I examined how groups use relevant information such as the advice from experts.

In Chapter 3 I answered the question under what circumstances groups are vulnerable for anchors. An anchor is an external (often numerical) piece of information on which decision-makers rely too heavily when making estimations or judgments, even when such an anchor is unimportant or objectively useless (Tversky & Kahneman, 1974). For instance, Englich and colleagues (2006) found that legal experts gave longer sentences after a roll of two dice resulted in a high number than when such a roll resulted in a low number. Similarly, a more informative anchor such as the first offer someone makes in a negotiation tends to disproportionately influence the remainder of the negotiation process and the final deal (Galinsky & Mussweiler, 2001). The anchoring-bias is an extremely pervasive, strong and common decision-making bias (Klein et al., 2014), but
up till now it was unknown whether groups would use anchors, just like individuals do.

Previous work suggests that on the one hand groups might be influenced by anchors because anchors would quickly and reliably influence the decisions of the individual group members. These decisions would then form the basis of the, consequently also biased, group judgment (see Schulz-Hardt et al., 2006). Yet, on the other hand, group decision-making requires members to combine – often opposing – preferences which could interfere with the anchor, suggesting that groups would be less susceptible for the anchoring-bias (see Sniezek, 1992). These opposing predictions were tested in three experiments in which groups consisting of three people read a criminal case, discussed the case, and jointly decided about the prison sentence of the defendant. Before the start of their group discussion, groups were presented with an anchor, by drawing a ticket from a bowl. The ticket held a number that represented the demand of the prosecution for a certain number of months prison sentence.

In Study 3.1 I found clear evidence that group judgments were influenced by the anchor: groups that received a high anchor made significantly higher sentencing judgments than groups that received a low anchor. In two follow-up studies I replicated this general finding, yet I showed that the extent to which groups use an anchor depended on the extent to which group members experienced competition and process accountability.

In Study 3.2 groups received a high or low anchor and were either made process accountable, in which case they were told they would have to explain how they came to their decision (see Tetlock, 1992), or they did not receive this instruction. Previous work has shown that groups under process accountability engage in more systematic information processing (see Scholten et al., 2007). I hypothesized and showed that the anchoring-bias disappeared when groups were made process-accountable.
In Study 3.3 I examined the effects of competition on the use of anchors and argued that competition between group members results in group members experiencing more ownership over their ideas, and thus less willingness to update their preferences towards a new piece of information such as an anchor. Group members were either instructed to aim for a decision that represented all group members (cooperation), or a decision that represented their personal opinion (competition; see Nijstad & Oltmans, 2008), and received either a high, or low anchor. As predicted, I found that competition eliminated the effect of anchors, resulting in approximately equal sentencing judgments in both the high and the low anchor conditions.

Interestingly, in both Study 3.2 and 3.3 I found that the extent to which groups were influenced by the anchor was not predicted by the arguments group members exchanged in favor of a particular sentence. Instead, it was largely determined by the first sentencing preference group members exchanged during their discussion. As with first offers in negotiations, when group members’ preferences were influenced by the anchor at the beginning of the group discussion, the group judgment was likely to be influenced as well, regardless of the contents of the group discussion. Hence, it seemed that anchors influence group decision-making by quickly influencing the (exchanged) preferences of individual group members.

Based on the results reported in Chapter 3, competition thus seems to have a beneficial effect on group decisions when such decisions need to be shielded from unwanted irrelevant influences. Chapter 3 did not, however, answer the question whether the effect of competition was due to an enhanced ability in recognizing the irrelevance of the anchor, or due to a general reluctance to use external information. The latter process would imply that competitive groups would ignore external information even when it is important and useful. In Chapter 4 I investigated
how groups deal with relevant advice that is given by an expert group.

In Chapter 4 I report a group advice-taking experiment in which group members were asked to make a joint decision to answer several factual questions. I induced competition by incentivizing the relative performance of the individual group members: a group member would earn more when he/she performed better than the other group members. Cooperation was induced by equally rewarding all group members based on the group’s performance. In addition, groups either received advice from an expert group during group discussion, or the advice was given to each individual group member prior to the group’s deliberation. Following the results of Chapter 3, I predicted that competition would result in a reluctance to use external information, and thus in a lower than optimal level of advice-taking. Moreover, since making a joint decision before receiving advice appears to be a greater hurdle to advice-taking than making an individual decision before receiving advice (see Minson & Mueller, 2012), I predicted that groups would use the advice more when the advice was given to individuals instead of the group as a whole.

As predicted, and consistent with the findings of Chapter 3, I found that competitive groups were less likely to use external information: they took less advice than cooperative groups. However, when the advice was given to individual group members prior to the group discussion, advice-taking increased, particularly in competitive groups. Giving advice to individual members eliminated the difference in advice-taking between cooperative and competitive groups.

From both these chapters I conclude that competition tends to create an undiscriminating armor against outside information that is provided to the group. In some cases this might be beneficial, for example when the information is useless or even wrong, yet in most situations competition will result in the
underweighting of important information, which hurts group decision quality. In addition, these chapters make a second important contribution: they suggest that in order to effectively influence groups, advisors should aim to influence each individual group member instead of targeting whole groups. Interestingly, this finding fits with a practice often observed in lobbyists, who tend to target individual politicians instead of parliamentary committees or entire political parties.

**Competition between groups reduces the negative effects of competition within groups**

Groups in which members experience competition have more difficulty to engage in unbiased and effective information exchange than groups in which members act cooperatively (see Steinel & De Dreu, 2004; Toma & Butera, 2015). However, oftentimes, groups might also experience competition with other groups in addition to or instead of this competition within groups. In Chapter 5 I examined whether such competition *between groups*, or intergroup competition, would enhance information exchange and decision quality in groups, and could therefore reduce the negative effects of within-group competition. This prediction was (mostly) derived from work on economic games, which has shown that when faced with intergroup competition, group members become more willing to support their own group which tends to raise group performance (see Bornstein, 2003). As in Chapter 2, groups performed a hidden profile task, and as in the experiment described in Chapter 4, competition within groups was induced by giving group members incentives that either focused on group performance (cooperation) or group members’ relative individual performance (competition). Competition *between groups* was induced by, for each two groups, rewarding the group who identified the correct decision (and if both groups did that, rewarding the fastest group).
The results again showed that, as expected, group members in competitive groups tended to focus on preference consistent information. As a consequence, these groups failed to acquire a comprehensive and balanced overview of all information, which resulted in low decision quality. Cooperative groups, on the other hand, focused almost equally on preference inconsistent as on preference consistent information, resulting in higher quality decisions than those made by competitive groups. Yet, crucially, these adverse effects of competition within groups vanished in the presence of competition between groups. Under intergroup competition, unbiased information exchange was enhanced in competitive groups which brought their decision quality on par with cooperative groups. Cooperative groups’ decision-making quality was not affected by intergroup competition, yet they became extraordinarily more efficient: intergroup competition reduced the amount of speaking turns and spoken words by half, compared to the situation without intergroup competition. Since decision-makers need to make quick decisions in an innovation driven and fast moving economy, such an efficiency gain is important for the success of groups and organizations. All in all, this chapter underlines the dangers of using competitive incentives in group decision-making, but also shows that competition, when directed at another group, can have beneficial consequences for groups’ decision speed and quality.

**Conclusion**

This dissertation underlines the critical and damaging role of competition within groups on group decision-making. Competition promotes advocacy of one’s own preferences, biased exchange of information and less use of relevant information coming from outsiders. Such negative effects of competition can be reduced or made undone by addressing individual group
members instead of whole groups, or by facilitating competition between groups.

Most importantly however, this dissertation demonstrated the effectiveness of using cooperative, instead of competitive, incentives. Cooperation facilitates the unbiased exchange and use of all available information. When such information is irrelevant, cooperative groups are likely to flounder, yet in most cases cooperation increases groups’ chances of reaching high quality decisions. Thus, under cooperation, groups show their unique potential in reaching outcomes that none of its individual members could have achieved with the same level of certainty.

Making good decisions as a group is almost always a struggle. Such struggles are often a prelude for success when groups are cooperative or a prelude for misfortune when groups are competitive.