General Discussion
With the increased globalization of society and importance of teamwork, workgroup diversity has become a central aspect of organizational life (Williams & O’Reilly, 1998). Research has shown that although workgroup diversity can potentially have beneficial effects, teams often have problems in managing their diversity (e.g., Mannix & Neale, 2006; Van Knippenberg & Schippers, 2007). Central to this thesis is the faultline perspective, which focuses on the demographic alignment of diversity attributes in a group creating relatively homogeneous subgroups within a team (Lau & Murnighan, 1998). As discussed in Chapter 1, faultline groups often suffer from disruptive group processes, which can hinder team performance. So far, relatively few studies have examined the relationship between faultlines and team learning and those few have found mixed results (Gibson & Vermeulen, 2003; Lau & Murnighan, 2005). In this dissertation, I examined the relationship between diversity faultlines and team learning. Based on other related literatures (i.e. conflict, commitment), I proposed a typology of team learning distinguishing different topics that teams can learn about: task, process, and social learning (see Chapter 1). In particular, I focused on moderators and mediators that can help explain when and how faultlines affect these team learning types. The central research question was: “Under which circumstances are faultlines beneficial or detrimental for team learning and what are the main underlying group processes explaining these effects?”

In the next section, I will summarize the main findings of the empirical studies reported in Chapters 2, 3, 4, and 5. This section will be followed by theoretical and practical implications. Finally, I will discuss some limitations of the studies and directions for future research.

**Summary of the Main Findings**

The goal of this dissertation was to investigate the circumstances and underlying processes that specify the relationship between faultlines and team learning. To examine this research question, I used a multi-method approach consisting of a validation study, two field studies, and a laboratory experiment.

In Chapter 2, I described the development of an instrument to measure the three types of team learning proposed in Chapter 1. Based on a review of
past team learning definitions and interviews with managers, I generated items to measure the different types of team learning. These items were validated using a pilot test on 255 individuals reporting about team learning in their workgroups. Transactive memory and team innovation, which are related constructs, were measured as well. The results showed that the three types of team learning were distinct and different from transactive memory and team innovation.

Chapter 3 and 4 described two field studies in which I examined the relationship between faultlines and the two work-related types of team learning: task and process learning. In Chapter 3, I focused on the role of perceptions of faultlines in the relationship between objective faultlines and outcomes internal and external to the team: team learning types and customer satisfaction. Although Lau and Murnighan (1998) proposed that faultlines should be perceived in the minds of individuals in order to have disruptive effects, past faultline has largely focused on objective faultlines and neglected to consider whether team members perceived faultlines (e.g., Gibson & Vermeulen, 2003; Lau & Murnighan, 2005; Thatcher et al., 2003). With this study, I contributed to this gap in past faultline research by taking into account team members’ perceptions of faultlines. It was hypothesized and found that when team members perceived faultlines, the negative effects of faultlines were strengthened resulting in lower levels of process learning and customer satisfaction. Additionally, I investigated the role of social learning as a second moderator, which I proposed would de-activate faultline effects. Social learning is the extent to which team members know each other personally through exchanging and processing non-work related information. The results partially supported the predictions, showing that faultline teams in which team members knew each other well had significantly higher levels of task learning than faultline teams in which team members did not exchange much personal information about each other. Social learning might therefore de-activate negative faultline effects.

In Chapter 4, another aspect of faultlines was examined that has largely been neglected in past faultline research, which is the role of faultline distance. Faultline distance is the distance between demographic subgroups (e.g., two females with 5 year work experience are closer to two males with 8 years work experience than to two males with 20 years work experience). This faultline distance may have an unique effect on team functioning (Bezrukova, Jehn, Zanutto, & Thatcher, 2009). Using a mediated moderation model, I examined the effect of the interplay between faultline strength and distance on task and
process learning. Additionally, I examined two mediating processes: psychological safety and transactive memory. Psychological safety is the collective belief that the team is safe for interpersonal risk taking and is found to positively affect team learning (Edmondson, 1999; Tjosvold, Yu, & Hui, 2004; Carmeli, 2007). Transactive memory is the extent to which team members are aware of the expertise of fellow team members which can also stimulate team learning (Lewis, Lange, & Gillis, 2005; Liang, Moreland, & Argote, 1995). I hypothesized and found that when faultlines were strong but the distance between subgroups was low, task and process learning were stimulated. Psychological safety and transactive memory mediated the relationship between the interplay between faultline strength and distance on task and process learning. Teams with strong but close subgroups had high levels of psychological safety and developed more extensive transactive memory systems, which stimulated task and process learning. Process learning, in turn, was positively associated with supervisor ratings of team performance. These results emphasize the importance of considering faultline distance in research on faultlines.

The final chapter describes a laboratory study in which I examined task learning in faultline versus cross-categorized groups. Additionally, the role of error culture was examined, which reflected team members’ beliefs about how errors should be handled (Van Dyck, Frese, Baer, & Sonnentag, 2005). In a 2 x 2 (group composition x error culture) design, 4-person groups were composed with a faultline versus cross-categorized composition. Two types of error cultures were manipulated: error management versus error aversion. Since faultline teams are more likely to suffer from disruptive routines, it was argued that faultline groups were more likely to be affected by the manipulation of error culture than cross-categorized groups. The results supported the predictions, showing that an error management culture stimulated task learning, while an error aversion culture inhibited task learning in faultline groups. Cross-categorized groups had relatively high and stable levels of task learning which were not affected by the team’s error culture. These effects were mediated by psychological safety and open communication. Faultline teams with an error management culture were more likely to act as a psychologically safe group and communicated more openly, which stimulated task learning, compared to faultline teams with an error aversion culture.

To reiterate the initial research question, in this dissertation I identified moderators and mediators that helped explain the circumstances and underlying processes that drive faultline effects on team learning. As Chapter 3
showed, faultlines can negatively affect outcomes internal and external to the team, especially when team members actually perceive faultlines. Thus, the perception of faultlines worsened faultline effects by lowering levels of process learning and customer satisfaction. In contrast, when team members knew each other well through social learning, negative faultline effects were less likely to arise. The findings of Chapter 4 illustrated the importance of considering faultline distance as a moderator, explaining the effects of faultline strength (Bezrukova et al., 2009). The results showed that groups with strong but close subgroups had higher levels of task and process learning than strong but distant subgroups. Furthermore, the results of Chapter 5 point towards another factor that can stimulate team learning in faultline groups, which is the role of the team’s error culture. The findings indicate that team learning can be stimulated in faultline groups by a team culture focused on the management of errors, rather than on error aversion. Finally, in this dissertation, underlying processes were also examined which explained faultline effects on team learning. As Chapter 4 and 5 showed, psychological safety appeared to be an important underlying process explaining team learning in faultline groups. In addition, transactive memory and open communication were identified as relevant underlying processes explaining faultline effects.

To summarize, this dissertation identified conditions under which faultlines affect team learning and uncovered mechanisms underlying faultline effects. In the next section, theoretical and practical implications will be discussed.

**Theoretical and Practical Implications**

In this dissertation, I contributed to past research on team learning by proposing a typology of team learning based on the topics that teams can learn about (task, process, and social learning). The results of this dissertation indicate that different types of team learning exist and that they can differentially affect other team outcomes. For instance, the results of Chapter 4 show that process learning was more important for team performance than task learning. Thus, it might be the case that in order to improve team performance, some teams need to switch their attention from learning about the content of the work
towards learning about how to work as a group. On the other hand, in knowledge-intensive groups focused on product innovations, it might be the case that task learning is more important for innovation than process learning. Therefore, researchers and managers should analyze what the main topics are that teams in different work settings learn about and how they are related to different team outcomes.

The main focus of this dissertation was the link between diversity faultlines and team learning. More specifically, I was interested in moderators and mediators that would help explain this link. Some findings in this dissertation support the general predictions following from the faultline perspective that faultlines would disrupt team functioning and performance. As Chapter 3 shows, faultlines can negatively affect outcomes internal and external to the team, especially when team members perceive faultlines. Although Lau and Murnighan (1998) assumed that faultlines must be perceived in order to disrupt group functioning, past faultline research has, for the most part, neglected to examine faultline perceptions. I contributed to past faultline research by examining the role of faultline perceptions and showing that when objective faultlines are perceived, negative faultline effects can be worsened. This finding is relevant for both researchers and practitioners concerned with managing faultlines in organizations. Faultline researchers should consider the role of faultline perceptions in their studies. Managers, in turn, could decrease the negative effects of perceived faultlines by emphasizing the superordinate team identity (Haslam & Ellemers 2005, Lipponen, Helkama & Juslin, 2003), for instance by organizing a team outing or by focusing on common group goals. Recent research indeed indicates that when team members identify with this superordinate team identity, negative faultline effects can be weakened (Bezrukova et al., 2009). A team outing can, at the same time, be an opportunity for team members to learn about non-work related topics. The findings of Chapter 3 indicated that when people know each other well through sharing non-work related information with each other, this can help in weakening negative faultline effects.

Another contribution of this dissertation is that I considered the role of faultline distance, which was found to be an important moderator of the relationship between faultline strength and team learning types (Chapter 4). So far, past faultline research has mainly examined the concept of faultline strength (cf. Bezrukova et al., 2009), or has implicitly included faultline distance in an overall group faultline score that does not allow researchers to disentangle the effects of strength and distance (e.g., Bezrukova, Thatcher, & Jehn, 2007; see
also Chapter 3). Only recently have researchers started to consider the interplay between faultline strength and distance (Bezrukova et al., 2009). As the results of Chapter 4 indicate, strong faultlines can act as healthy divides when subgroups are not too far apart. When faultlines are strong but subgroups are close, team members are more likely to feel psychologically safe which means that team members feel free to speak up, ask each other questions and feedback, and discuss difficult problems. At the same time, strong but close subgroups were more aware of the expertise available in the team and therefore developed better transactive memory system. These processes helped the team to learn about the task and about work processes. These findings emphasize the importance of considering faultline distance in future research on faultlines. It also implies that managers should not only take into account the alignment of demographic attributes, but also look at how far apart people from different subgroups are. By stressing the communalities that people from different subgroups have, faultline distance could be lowered. On the other hand, when subgroups are too distant (e.g., two 20-year old females with vocational training versus two 50-year old males with PhD’s), it could be better to divide the tasks according to which subgroup is good at what, or to add a group member who can act as a boundary spanner (Marrone, Tesluk, & Carson, 2007). This boundary spanner could bridge faultlines by identifying and expressing his or her communalities with both subgroups. Future research should examine the effects of boundary spanners in faultline groups.

Finally, I contributed to the literature on team culture, error handling, and team learning by experimentally manipulating a team’s error culture in groups with a faultline versus cross-categorized composition. Although past research has indicated that error culture is important for learning (Edmondson, 1996; 1999; Van Dyck et al., 2005; Rochlin, 1999), research has neglected to directly manipulate error culture at the team level. The results of Chapter 5 showed that the manipulation of the team’s error culture was successful and that it was more influential in faultline teams than in cross-categorized teams. An error management culture stimulated task learning in faultline groups while an error aversion culture inhibited task learning. When team members in faultline groups believed that they could discuss errors openly, they felt more psychologically safe and communicated more openly with higher levels of task learning as a result. Thus, an error management culture can be used to promote healthy faultlines. Managers can stimulate this team culture by creating an open atmosphere in which errors can be discussed, without blaming people. For instance, managers could promote the sharing of well-managed error incidents.
as best practices in general team meetings and use error incidents as a learning opportunity.

**Future Research Directions**

The proposed typology of task, process, and social learning can help researchers to deepen their understanding of the concept of team learning. The team learning typology also suggests new avenues for research on team learning and group composition, which we address in this section. First, the role of social learning needs to be further examined. Future research should clarify how social learning is related to certain group processes and outcomes. In Chapter 3, social learning appeared to be a moderator of the relationship between faultlines and work-related types of team learning. However, social learning could also be considered as a dependent variable, or a mediator explaining other types of team outcomes. Although it was not the objective of this dissertation, it might be that social learning is related to more affect-based outcomes, such as satisfaction, cohesion, and commitment. It might also have different antecedents (i.e. relationship conflicts) than the work-related types of team learning. Secondly, our typology may be extended in the future by considering additional types of team learning that refer to other subjects that teams can learn about, such as their relationship with the external environment (e.g., clients, competitors).

Another direction for future research regarding the team typology is to examine the dynamic nature of different types of team learning in groups at different stages (Gersick, 1988; Tuckman & Jensen, 1997; Wheelan, 2004). Some types of team learning might be more important in the beginning, while others become more important when team members work longer together. For instance, when a group of individuals is recently formed to accomplish a task it is likely that it starts with some form of task and process learning. Learning about each other’s hobbies and lifestyles might be more likely to develop later on in the process of getting to know each other better, for instance during a happy-hour outing or during lunch. Future research should investigate which types of team learning are beneficial at different stages. On the contrary, team learning can sometimes also be distracting and inhibit effective team performance, especially in early phases (Bunderson & Sutcliffe, 2003). Some
types could be more distractive than others. For instance, through social learning team members may discover that they are not as different as they thought, which can stimulate them to also exchange work-related information and improve team performance. On the other hand, social learning can also sometimes distract the team from effective performance when there is a deadline and the team has to be very task-focused. Therefore, future research should examine the extent to which team learning types can be distracting or important at different stages of the group’s development.

Furthermore, this dissertation showed that faultlines were more likely to inhibit team learning when they were perceived. Faultlines are perceived when they become activated in the minds of individual team members through a certain occasion or policy (Lau & Murnighan, 1998). For instance, HR practices focused on certain social groups (e.g., elderly, cultural minorities, women, part-time workers etc.) can trigger certain social identities, which will activate faultlines. In this dissertation, I did not examine the specific circumstances that can activate faultlines. Future research should examine the faultline activation process by identifying factors that can activate faultlines in the minds of individual team members (Jehn & Bezrukova, in press).

Future research should also investigate whether the demographic characteristics traditionally examined in faultline research (e.g., gender, age, race, educational level) are the most relevant attributes that activate faultlines (e.g., Thatcher, Jehn, & Zanutto, 2003; Lau & Murnighan, 2005; Li & Hambrick, 2005). It might be that faultlines based on other dimensions such as work style or personality are more likely to trigger and explain faultline effects than the traditional demographic attributes (Greer, 2008; Jehn & Bezrukova, in press). In line with this, perceptions of faultlines may also be asymmetrical between team members, with members perceiving different levels of subgroup formation or different faultline bases. Asymmetrical perceptions can have a negative impact on team members’ satisfaction and the performance of the team (e.g., Jehn, Rupert, & Nauta, 2006; Jehn, Rispens, & Thatcher, 2009). Therefore, future research should not only measure whether team members perceive faultlines, but also what the faultline base is and whether team members differ in their perceptions of faultline levels and bases.
Conclusion

In this dissertation, I examined the relationship between faultlines and team learning, using a multi-method approach. A typology and instrument for measuring team learning types was developed based on the topics that teams can learn about: task, process, and social learning. Furthermore, I extended past faultline research by considering different aspects of faultlines, such as the role of perceptions of faultlines and faultline distance as moderators of the relationship between objective faultlines and team learning. These aspects of faultlines inhibited team learning in faultline groups. On the other hand, team learning was stimulated when team members knew each other well, when the distance between subgroups was low and when the team’s error culture was focused on the management of errors rather than on error aversion. Finally, underlying processes were examined which were found to explain the relationship between faultlines and team learning: the team’s psychological safety, transactive memory, and open communication. The results of this dissertation have important implications for future research and for the management of diversity in organizations. When diversity faultlines are managed well, subgroups can act as healthy divides stimulating team learning and performance.