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## Diversity faultlines and team learning

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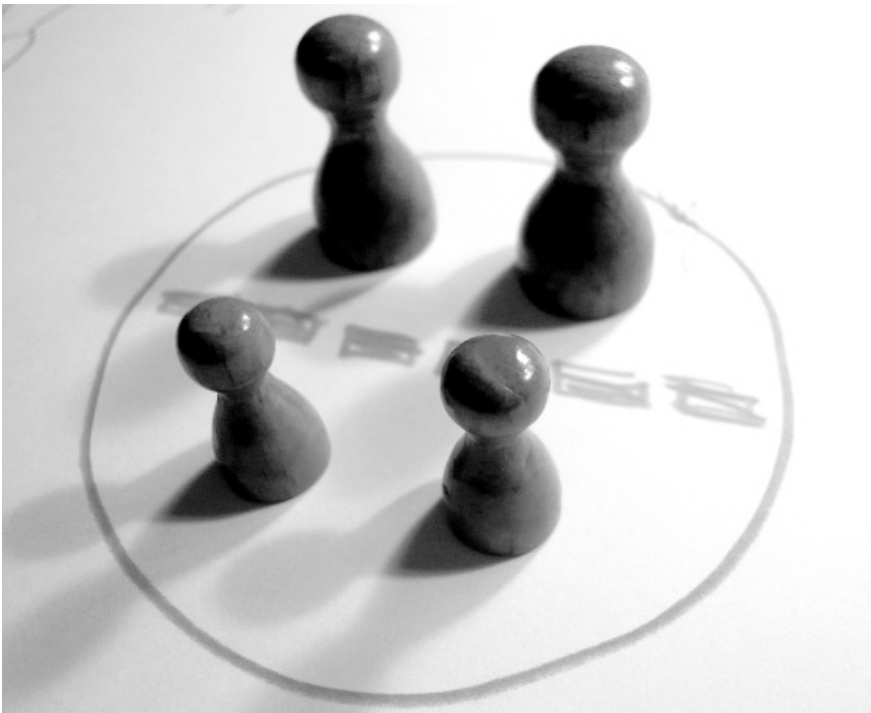
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# When Subgroups Fuse and Divide

## Effects of Faultlines on Team Learning and Customer Satisfaction<sup>1</sup>



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<sup>1</sup>This chapter is based on Rupert, J. & Jehn, K.A. (2009b) and is therefore written in the first-person plural.



**D**ue to increased globalization and the complexity of jobs, diversity has come to play a central role in organizations (cf. Williams & O'Reilly, 1998). Additionally, teamwork is becoming more important and team learning is a major condition for organizational performance and innovation (cf. Wilson, Goodman & Cronin, 2007). However, it remains a difficult challenge to manage diversity in a way that the exchange of knowledge and experiences from people with multiple diverse backgrounds leads to learning and high performance. In this study, we build on the faultline perspective (Lau & Murnighan, 1998) for studying group composition, focusing on the simultaneous alignment of multiple demographic attributes. Although this framework has been shown to more thoroughly explain diversity effects than research drawing on traditional heterogeneity indexes (e.g., Bezrukova, Thatcher & Jehn, 2007; Lau & Murnighan, 2005; Li & Hambrick, 2005), findings are still inconclusive.

Faultlines can be defined as hypothetical dividing lines which can split a team into relatively homogeneous subgroups based on the alignment of demographic characteristics (definition adapted from Lau & Murnighan, 1998). An example of a team with strong faultlines is a team consisting of two senior male business analysts and two junior female human resource managers. In this example, gender, job experience, and job function align with each other, creating two homogeneous subgroups. Faultline theory argues and research shows that the compositional dynamics of multiple demographic characteristics affect group processes more than separate attributes (Bezrukova et al, 2007; Lau & Murnighan, 1998; 2005). Research on faultlines so far has found that faultlines increase levels of intra-group conflict (e.g., Lau & Murnighan, 2005, Li & Hambrick, 2005; Molleman, 2005), and decrease levels of performance (e.g., Bezrukova et al., 2009; Sawyer, Houlette & Yeagley, 2005; Homan, Van Knippenberg, Van Kleef, & De Dreu, 2007b; Homan et al., 2008; Rico, Molleman, Sánchez-Manzanares, & Van der Vegt, 2007), strategic innovation (Barkema & Svyrov, 2007), creativity (Pearsall, Ellis & Evans, 2008), satisfaction (e.g., Bezrukova, Jehn, Zanutto & Thatcher, 2009; Homan et al., 2007a), behavioral and social disintegration and cohesion (e.g., Li & Hambrick, 2005, Molleman, 2005; Rico et al., 2007; Sani, 2005), while some studies found no effects on particular outcomes (Lau & Murnighan, 2005), or found that moderate levels of subgroup formation can be good (Gibson & Vermeulen, 2003; Thatcher et al., 2003). In this study, we investigate shop floor management teams in a large grocery store chain to see how faultlines influence two different types of team outcomes: team learning types (task and process learning) as internal team outcomes, and performance ratings from a source external to the team: customer satisfaction

(Hackman, 1987). In general, these two sets of outcomes internal and external to the team have been relatively ignored in past faultline research. We study customer satisfaction to see how processes internal to the team impact ratings from outside the team. Additionally, we draw on recent team learning research (Rupert & Jehn, 2008) which suggests that teams can learn about different topics and investigate two different types of team learning outcomes: task and process learning.

Secondly, most past empirical studies have neglected to consider conditions under which faultlines can be activated and de-activated. We therefore suggest two important factors that activate versus deactivate faultlines, which are perceptions of faultlines and the role of social learning. Lau and Murnighan (1998) argued that faultlines must be activated in order to disrupt group processes and outcomes. However, most past research has only looked at potential faultlines based on demographic characteristics which can potentially split the team into subgroups and thus neglect to consider whether team members perceive these subgroups (cf. Zellmer-Bruhn, Maloney, Bhappu, & Salvador, 2008). In this study, we measure both potential and perceived faultlines to examine how they interact with each other to influence internal and external team outcomes.

We also examine the role of social learning (Jehn & Rupert, 2007; Rupert & Jehn, 2008) as a faultline de-activator, moderating the relationship between potential faultlines and team outcomes. Social learning is the process of getting to know each other personally by sharing information about non-work related matters, such as each other's family lives and hobbies. This factor is likely to influence the interaction of team members at work, since it can integrate team members who usually do not connect with each other for work-related matters (Rupert & Jehn, 2008). Therefore, we expect that social learning can bridge faultlines through communication and learning about matters unrelated to the task. We expect that this factor will weaken negative faultline effects on team learning types and act as a moderator. In the next sections we introduce our theoretical model (see Figure 1) and hypotheses.

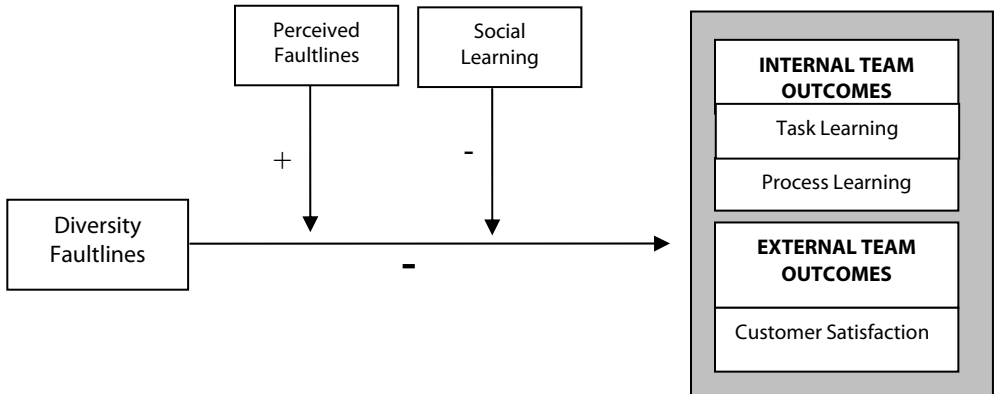


Figure 1. Theoretical Model Linking Faultlines to Team Learning and Customer Satisfaction

## Theoretical Model and Hypotheses

### Team Learning Types

Although some research has been done on the relationship between faultlines and team performance, only a few studies (Gibson & Vermeulen, 2003; Lau & Murnighan, 2005) have examined the effects of group faultlines and team learning and the few that did have found mixed results. Gibson and Vermeulen (2003) found that strong faultline groups had lower levels of team learning, while moderate levels of subgroup strength were related to higher levels of team learning. However, Lau and Murnighan (2005) did not find support for their hypothesis that strong faultlines would negatively impact team members' perceptions of group learning. In their study, faultlines were unrelated to group learning. In these and others studies on team learning (e.g., Argote et al., 2001; Edmondson, 1999; Hinsz, Tindale & Vollrath, 1997), it was not specified what topics teams can learn about.

Gibson and Vermeulen (2003) defined team learning behavior as a cycle of activities, existing of experimentation, reflective communication, and knowledge codification, which a team engages in to process knowledge in order to adapt and improve (Gibson & Vermeulen, 2003). Although this operationalization of constructs entails multiple processes which are important

for the concept of team learning, such as open communication, information sharing, and documenting ideas and procedures, they do not explicitly specify what *topics* teams learn about. Lau and Murnighan (2005) defined and measured team learning according to Edmondson (1999), who distinguished team learning behaviors, such as “asking questions, seeking feedback, experimenting, reflecting on results, and discussing errors or unexpected outcomes of actions” (p. 353). Although Edmondson’s work made important contributions to the team learning literature in distinguishing the processes and behaviors associated with team learning, these behaviors do not specify what topics team members ask questions and share information about, and seek feedback on.

However, as literature on social cognition suggests (e.g., Cannon-Bowers & Salas, 2001; Klimoski & Mohammed, 1994), teams share information about different topics and it is important to know the content of the information that people share. Although some past concepts and definitions of team learning refer to specific topics (e.g., Van der Vegt & Bunderson, 2005; Hinsz et al., 1997), only recently a structural typology of team learning topics has been proposed (Jehn & Rupert, 2007). This is the first empirical study linking faultlines to these types of team learning. We thereby try to reconcile past inconclusive findings regarding the relationship between faultlines and team learning.

We define team learning as a process of interaction and reflection in which team members actively acquire, process, and share knowledge, information, and ideas, in order to improve team performance (based on Argote et al., 2001). According to the team learning typology proposed by Jehn and Rupert (2007) teams can learn about three different topics: the content of the task, work processes and routines, and social relationship in the team. In the theoretical model in this study (see Figure 1), we investigate task and process as team learning outcomes, resulting from processes internal to the team. The third type of team learning we label as social learning, which we propose will moderate the relationship between faultlines and task and process learning and customer satisfaction. We first discuss definitions and examples of the team learning types below.

When teams learn about the *task*, they improve their understanding of the task by sharing and reflecting upon knowledge, ideas, and insights regarding the task (e.g., Argote et al., 2001; Van der Vegt & Bunderson, 2005), in order to improve team performance. Imagine a marketing strategy team finding the best of different sorts of marketing strategies for a particular

customer. As a team, they learn about the task through exchanging and reflecting upon information about different possible marketing strategies. By exchanging their knowledge, experiences, and ideas about these strategies, they enhance their understanding about the implementation of marketing strategy in different circumstances.

However, teams can also learn about the *process* of working together (e.g., Schippers et al., 2003; Tjosvold et al., 2004). This is what is called *process learning*, which is the pattern of interaction through which team members create and learn about work routines and make adjustments in their work processes according to what is effective (e.g., delegating issues, defining team roles etc). Returning to our example of the marketing strategy team: when the team decided which strategy to take, they discuss who is going to do what. Based on their earlier discussion about each member's knowledge and expertise they can now divide the tasks and responsibilities. This is an example of process learning. In this study, we examine these two types of team learning as team outcomes, directly resulting from internal processes in the team.

## **Faultlines and Internal Team Outcomes: Task and Process Learning**

When subgroups form along characteristics such as gender, age, and educational level, this is likely to influence task learning. In order to learn about the task at hand, members of a team have to come up with ideas and insights regarding the task. Through interaction with each other, team members share and combine these insights and reach agreement on, for instance, what the problems and potential solutions of this specific task are (Gibson & Vermeulen, 2003). In teams with strong faultlines, however, team members of the same subgroups are likely to have similar ideas and insights, since people with similar demographic backgrounds often share similar viewpoints (e.g., Walsh, 1988). As a result, subgroup members are confirmed in their view and opinions regarding the task by their fellow subgroup members and consequently, team members will be less open to insights and ideas suggested by the other subgroups. The team can become divided through ingroup-outgroup biases and polarization of task-relevant ideas between subgroups (Byrne, 1971; Lau & Murnighan, 1998; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). This polarization of ideas can prevent subgroup members from sharing task-relevant ideas and insights across subgroups (Milliken & Martins, 1996), leading to subgroup members following the opinions of their fellow subgroup members thoughtlessly.



Following predictions from social categorization and social identity theory (Tajfel, 1982; Turner, 1987; for reviews see Ellemers, Haslam, Platow, & Van Knippenberg, 2003; Ellemers, Spears, & Doosje, 2002), members of polarized groups are found to be myopic in the information they consider and are likely to develop distorted perceptions and views about themselves and others. This can negatively impact task learning, because for learning to occur, team members need to share and reflect upon all task-relevant information and insights, in order to improve (Edmondson, 1999; Gibson & Vermeulen, 2003; Wilson et al., 2008).

When subgroups do interact with each other and exchange viewpoints, it is likely that the two or three members who form subgroups join together to speak up for their own interest. This can harm trust in the overall workgroup and hurt the group goal (Komorita & Kravitz, 1981; Polzer, Mannix, & Neale, 1998). This subgroup formation can lead to competition within the overall workgroup (Brewer, 1996; Insko & Schopler, 1998), which can eventually lead to task and relationship conflicts between the subgroups (Early & Mosakowski, 2003; Li & Hambrick, 2005). And although research suggests that task conflicts can promote more extensive elaboration of information (e.g., De Dreu, Harinck, & Van Vianen, 1999; Jehn et al., 1999), task conflict is likely to act similarly as relationship conflict when team trust is low (Simons & Peterson, 2000). Therefore, we expect that in strong faultline groups both task and relationship conflict will have detrimental effects (e.g., Lau & Murnighan, 2005, Li & Hambrick, 2005). As a result of the processes mentioned above, the generation of task-relevant ideas and insights in the team as a whole is reduced, the sharing and reflecting upon these ideas suffers, and low levels of trust prevent potentially productive task conflicts from being addressed and resolved. We therefore propose that:

**Hypothesis 1a.** *Faultlines will be negatively associated with task learning.*

Faultlines are also likely to influence process learning, since in order to learn as a team about its processes and work routines, members need to discuss the process of working together. However, when subgroups based on demographic characteristics polarize due to stereotypes and ingroup-outgroup biases (Lau & Murnighan, 1998; Milliken & Martins, 1996), it is unlikely that members will express constructive criticism and question ideas (Lau & Murnighan, 2005). Researchers have argued and shown that the willingness of employees to participate in constructive debate diminishes significantly when

they perceive the team as hostile (e.g., Dutton, 1993; MacDuffie, 1997). Due to these disruptive processes, team members will be less likely to bring up problems that they have with working together in order to dissolve ineffective processes and adjust work routines in order to improve team performance.

Additionally, subgroup members are more likely to develop and adjust work routines within their subgroup of similar people, which will inhibit process learning as well. Team members who differ on demographic characteristics may face “interpretive barriers” due to members’ different language systems, life experiences, or values acquired from varying socialization experiences (Dougherty, 1992; Jehn et al., 2009). Based on social groups, like for instance men and women, individuals might have different conventions regarding social interactions at work and task accomplishment (Jehn et al., 1999; Von Glinow, Shapiro, & Brett, 2004). In groups in which these social groups align with each other it is more likely that members within the same subgroup develop similar routines and procedures to carry out their work (Rink & Ellemers, 2006). Therefore, it is likely that within the subgroup there is more communication about how the work is being done than between the subgroups, especially when work can easily be divided. As a result, there will be less reflection at the team level on how work procedures and routines could be improved in order to perform well and efficient, which is a crucial factor in adjusting work routines and improving team performance (Schippers et al., 2003; Tjosvold et al., 2004). Therefore, we expect that faultlines will hamper learning about work processes and routines. We propose that:

**Hypothesis 1b.** *Faultlines will be negatively associated with process learning.*

## **Faultlines and External Team Outcomes: Customer Satisfaction**

Few field studies on workgroups that examine the relationship between faultlines and team performance have investigated objective team performance coming from an *external* source (for exceptions see Barkema & Shvyrkov, 2007; Bezrukova et al., 2009; Li & Hambrick, 2003). However, past research has shown that team processes significantly affect team outcomes such as financial performance and customer satisfaction (for reviews see e.g., Guzzo & Dickson, 1996; Kozlowski & Bell, 2001). In this study we examine how

processes of subgroup formation within the team affect outcomes from outside the team. In particular, we examine customer satisfaction since customers are the end users of products in a store and can make a shop profitable. When customers are satisfied they are more likely to repurchase products and to continue buying their products in this store (Macintosh & Lockshinb, 1997; Sivadas & Baker-Prewitt, 2000). Moreover, in contrast to financial outcomes, customers in a store evaluate the service they get by evaluating their interaction with floor personnel in the shop and therefore can be considered as a good reflection of outcomes external to the team.

In line with previous research (e.g., Giardini & Frese, 2008; Steenkamp, 1990) we define customer satisfaction as summarizing value judgments of recipients of goods and services about products and services. The way team members coordinate and manage their collective efforts and their interpersonal processes is likely to influence their response to the needs of their customers (Hyatt & Ruddy, 1997; Mathieu, Gilson & Ruddy, 2006), thereby influencing customers' satisfaction. The shop floor management teams, which we investigate in this study, generally have 3 to 7 members, who are sales managers and sales specialists responsible for the service of specific products in the grocery store (e.g., bread, vegetables, meat, wine etc). They help customers with these specific products and also manage other workers who help customers with these products. Since the team members of the shop floor management team are responsible for the direct shop floor service towards customers and for the management of the personnel and the overall store, we expect that processes internal to those teams will impact customers' satisfaction.

As argued before, faultline teams suffer from polarization around demographic characteristics, which can prevent subgroup members from sharing information across subgroups (Milliken & Martins, 1996). For instance, due to differences in age and educational level some sales specialists might not communicate with the general sales manager about problems that customers have with specific products or services in the store. It could be that customers would like to see more of a specific wine or vegetable. However, when this is not communicated and the team does not make changes in their product supplies these needs of customers will not be addressed, which will decrease customers' levels of satisfaction.

Additionally, due to the increased polarization between subgroups in faultline teams, team members might be inhibited to ask questions and ask for help (Lau & Murnighan, 2005). As a result, the situation could occur that

relatively inexperienced team members send customers with their question or complaint to other colleagues in order not to have to ask their colleagues for help themselves. The customer will feel that he is being passed along, which will decrease his or her level of satisfaction with the service of the store.

Moreover, research on customer satisfaction has consistently shown that employees' attitudes and behaviors influence the perceptions and evaluations of customers (e.g., Giardini & Frese, 2008; Schneider & Bowen, 1985). According to emotional contagion theory people tend to converge emotionally, so when an individual displays positive emotions, the other person tends to experience a corresponding positive affective state (Hatfield, Cacioppo, & Rapson, 1994). Recent studies in the service context have shown that when employees display positive emotions (e.g., smiling, or friendly greetings) this positively influences the affective state of the customer (Giardini & Frese, 2008; Pugh, 2001). We expect that when disruptive group processes exist resulting from strong faultlines (e.g., Bezrukova et al., 2009; Li & Hambrick, 2005), this will negatively influence team members' affective states. Thus, through a process of emotional contagion the processes internal to the team will negatively deliberate upon the customer's rating of satisfaction with the store and the services. Thus, we propose that:

**Hypothesis 1c.** *Faultlines will be negatively associated with customer satisfaction.*

## Faultline Perceptions

As Lau and Murnighan (1998) argued in their original faultline theory, faultlines can go unnoticed for years without affecting group processes. This implies that faultlines need to be activated in the minds of individual team members, in order to affect team processes. However, the majority of the recent work on faultlines examined faultlines based on objective demographic characteristics such as gender, age, and race (e.g., Lau & Murnighan, 2005; Li & Hambrick, 2005; Pearsall et al., 2008; Sawyer, Houlette, & Yeagley, 2006; Thatcher et al., 2003), neglecting to consider whether team members actually perceive these subgroup splits based on demographic characteristics (for exceptions see Earley & Mosakowski, 2000; Jehn & Bezrukova, in press). As the studies mentioned above indicate, potential faultlines do have their effects on

processes and outcomes. However, in line with faultline theory (Lau & Murnighan, 1998), we expect that the effects of potential faultlines will be stronger when people actually perceive them. In this study, we therefore take perceptions of faultlines into account, as a moderator enhancing the negative effect of objective faultlines.

Faultline activation can be defined as the process by which potential alignments based on objective demographic characteristics are actually perceived by group members (Jehn & Bezrukova, *in press*). We draw on previous diversity research, which has conceptually distinguished objective and perceived demographic differences within groups (e.g., Garcia-Prieto, Bellard, & Schneider, 2003; Zellmer-Bruhn et al., 2008), which is supported by empirical research on surface- and deep-level diversity (Cunningham, 2007; Harrison, Price, & Bell, 1998; Phillips & Loyd, 2006), value and goal diversity (e.g., Jehn et al., 1999), and perceived diversity in ingroups and outgroups (e.g., Lee & Ottati, 1993). Additionally, literature on supervisor-subordinate relations has suggested that perceived differences often are more likely to impact interactions than objective demographic differences (cf. Strauss, Barrick, & Connerley, 2001; Turban & Jones, 1988).

However, few studies examining the effects of faultlines take into account whether team members perceive faultlines, while people do not necessarily have accurate perceptions of diversity (cf. Jehn, Greer, & Rupert, 2008). In a recent study by Zellmer-Bruhn et al. (2008) it was found that the objective demographic composition within a group was not related to perceived demographic similarity. The authors suggest that the potential and perceived faultlines do not necessarily simultaneously converge. Therefore it is critical for faultline research to take into account both the alignments based on objective demographic characteristics as well as the perceptions of these demographic alignments. Past empirical research has actually provided limited examinations of the faultline construct by only taking objective demographic subgroup divisions into account and neglecting to consider perceptions of these demographic subgroup splits (cf. Jehn & Bezrukova, *in press*).

In this study we propose that when team members actually perceive that their team splits up into subgroups based on the alignment of demographic characteristics, this will disrupt team processes even more than when faultlines are not perceived (Zellmer-Bruhn et al., 2008). Based on self-verification theory (Swann, Polzer, Seyle, & Ko, 2004) people seek confirmation of their thoughts through interaction with others. When team members perceptions of the team are validated by other (subgroup) members, faultlines

are more likely to arise and strengthen ingroup-outgroup biases, stereotypes and biases, and inhibited information sharing between subgroups (Milliken & Martins, 1996; Turner et al., 1987). Recent research indeed shows that when the demographic characteristics that the potential faultlines are based on, are activated, the effects of potential faultlines are most powerful (Jehn & Bezrukova, in press; Pearsall et al., 2008). Therefore, we propose that the effects of faultlines are most detrimental when team members perceive subgroups based on the same characteristics to team outcomes.

**Hypothesis 2.** *The relationship between faultlines and team outcomes (task and process learning and customer satisfaction) is moderated by perceived faultlines, such that when people perceive demographic subgroups, the relationship between faultlines and team outcomes is strengthened*

## **A Faultline De-Activator: Social learning**

Some past team learning researchers have referred to examples of learning about the task (e.g., Van der Vegt & Bunderson, 2005, Hinsz et al., 2007) and, to a lesser extent, learning about team processes (e.g., Schippers, Den Hartog & Koopman, 2003; Tjosvold, Yu & Hui, 2004). An important omission, however, has been that teams can share information and learn about non-work related issues (Rupert & Jehn, 2008), which can be called social learning. We define *social learning* as the process through which team members get familiar with each other by sharing information about personal matters (Jehn & Rupert, 2007). An example of a team with high social learning would be a team that schedules meetings in the morning, since one team member has to leave early to pick children up from school and another team member prefers morning meetings, because his best time to think is in the morning. Social learning can facilitate task and process learning in groups with a specific composition, such as faultline groups, which is what we propose in our theoretical model (see Figure 1).

To examine social learning in faultline teams, we draw on literatures from diversity types (e.g., Jehn et al., 1999), social support (Beehr, 1986), organizational citizenship behavior (Organ, 1990) and work-family balance (Lapierre & Allen, 2006; Thompson, Beauvais & Lyness, 1999). Based on these literatures, we argue that social learning in faultline teams will facilitate task and

process learning and customer satisfaction. As Mischel and Northcraft (1997) noted, a workgroup's success depends not only on its ability to perform a task, but also on the team's ability to manage its own social interactions effectively. For instance, group research suggests that the extent to which a workgroup can embrace, experience, and manage (rather than avoid) conflict that arises is an important determinant of group performance (Tjosvold, 1991). Some similarity in perspectives (e.g., value diversity) among team members is needed to ensure that enough common ground exists to facilitate successful group interactions (Jehn et al., 1999). Although differences in a team based on one type of diversity (e.g., social category diversity) can be dysfunctional, when commonalities exist on a different sort of diversity, like for instance value diversity, the social category faultlines might not be as detrimental, as if value diversity would be high as well (Jehn et al., 1999). Social learning can act as "social glue" in finding commonalities between team members from different subgroups (Thatcher & Zhu, 2006; Van Vugt & Hart, 2004). It will also facilitate more work-related communications between team members from different subgroups, thereby restoring the common ground in faultline teams, leading to more effective processes.

Similarly, literatures on social support (Beehr, 1986; Greenhaus & Parasuraman, 1986) and organizational citizenship behavior (Organ, 1990) show that social behaviors which go beyond employees' formal job requirements are necessary for the successful functioning of organizations and teams. Research shows that providing social support to colleagues at work is an important factor in managing various life stressors and promoting employee task performance (cf. Chiaburu & Harisson, 2008). In line with this, literature on work-family balance shows that when colleagues and supervisors at work help balancing work and family life, this positively influences employees' affective well-being (Lapierre & Allen, 2006), job satisfaction (Allen, 2001), and employees affective commitment (Thompson et al., 1999). Through processes of social learning team members will exchange information about potential life stressors, which gives them the opportunity to support each other in work and non-work-related matters. As a result, subgroups in a team which are divided along demographic lines can become more integrated through social learning, thereby facilitating other more work-related types of learning, such as task and process learning. They will coordinate and manage their collective efforts better, working as a team toward a common performance goal without process loss. This is likely to also influence the team members' responses towards the need of the customers (Hyatt & Ruddy, 1997; Mathieu et al, 2006). When the

team is more integrated and communication lines are short, customers will be served more effectively. We therefore expect that when social learning is high, faultlines will be less likely to negatively influence customers' satisfaction and work-related types of team learning, such as task and process learning. We therefore hypothesize that:

**Hypothesis 3.** *The relationship between faultlines and team outcomes (task and process learning and customer satisfaction) is moderated by social learning, such that when social learning is high, the relationship between faultlines and team outcomes is weakened.*

## Method

### Data and Sample

To test our hypotheses, we conducted a field survey of 49 shop floor management teams in The Netherlands. This sample was the result of a response rate of 41%, which is considered a good response rate in field research (Baker, 1994). Additionally, we collected full demographic information on gender, age, and educational level for the teams in our sample ( $N = 31$ ). The mean age of participants was 38.3 years, 39.8% were female, and 96.7% were Dutch. The educational level of participants ranged from high school education (27.1%), lower vocational education (32.4%), to higher education and university (31.9%). The average team tenure of team members was 2.4 years, 88.2% of the participants worked fulltime, and the average group size was 4.8 members.

### Procedure

The data collection consisted of surveys that were sent to the shop floor management teams at different locations. Two weeks prior to the data collection, the organization made an announcement about the research by email, in which members of the management teams were asked to fill in the survey that would be sent, and in which the confidentiality and anonymity of the survey was guaranteed. Each store received an envelope containing surveys for each team member (group size differed between 3 and 7 members) and



participants were asked to send the survey back within two weeks, using a return envelope. The week after the survey was sent participants received a reminder from the organization. According to field techniques for improving response rates in mail surveys (Dillman, 1991), we improved our response rate by calling the stores where we were missing surveys to ask participants to fill in the survey. We sent new surveys to participants who lost the survey for some reason.

## Measures

**Faultlines.** We measured faultlines using the measure developed by Bezrukova et al. (2009). This formula uses a cluster algorithm to quantitatively assess the degree to which team members align with each other, creating subgroups on the basis of demographic characteristics. This measure also takes into account faultline *distance*, which is a measure reflecting how far away the subgroups are from each other (for instance two females of 25 and 27 years old and two males of 55 and 52 years old are further away from each other than two females of 42 and 44 and two males of 55 and 52 years old). To account for the joint effect of faultline strength and distance, we multiplied strength and distance after standardizing these scores, and used this overall group faultline score in our analyses (Bezrukova et al., 2007). In this study, we calculated overall faultline scores based on gender, age, and educational level, since we had full demographic information based on these characteristics. The mean of this variable was  $M = .62$ , with scores ranging from  $-1.39$  to  $3.87$ .

**Perceptions of faultlines.** To measure this construct, we adapted and extended the activated faultline scales by Zanutto et al. (in press). We used an 8-item scale and asked participants to rate each item on a 1 (completely disagree) to 7 (completely agree) likert scale. Sample items were “My team often splits into subgroups while we work”; “I feel that there are different subgroups in my team”, and “I am often aware of the presence of different subgroups in our team while we work”, linked with a list of demographic characteristics asking to what extent team members perceived subgroups based on each characteristic, again on a 1-7 likert scale (gender  $M = 2.6$ ,  $SD = 1.7$ , age,  $M = 2.8$   $SD = 1.8$ , educational level  $M = 2.5$ ,  $SD = 1.6$ ), see Table 1 for factor loadings. The scale had a mean Cronbach’s alpha reliability coefficient of .93, an intraclass correlation ICC[1] of .12, an ICC[2] of .40, and  $r_{wg} = .83$ , which is acceptable for team research (Bliese, 2000; Klein & Koslowski, 2000).

**Social learning** was measured using a 7 item scale measuring the extent to which team members knew each other personally, learned about non-work related issues and whether this improved their team performance. The Cronbach's Alpha of this scale was .88, ICC [1] = .00, ICC [2] = .01, with  $\eta^2 = .30$  and  $r_{wg} = .62$ . This scale did not yield a significant *F*-statistic in an ANOVA, resulting in a very low ICC value, indicating a greater within- than between-group variance. However, this result may be attributed to low between-group variance, as indicated by the acceptable  $\eta^2$  score (Langfred, 2007). When variance is low, as is the case with this variable, estimates of reliability can be artificially low with statistics such as the ICC (George & James, 1993).

**Task and process learning.** To measure task and process learning we used the scales developed by Rupert and Jehn (2008). The factor solution of these scales was confirmed (see Table 1 for factor loadings and items). The scale of *task learning* consisted of seven 1-7 Likert scale items, which measured the extent to which team members felt that they shared knowledge, expertise, and opinions about the task and reflected upon insights regarding the task. We also asked to what extent this learning about the task improved team performance. We measured process learning using a 6-item scale, asking about the extent to which team members thought their team learned about work processes and routines. The Cronbach's alpha for task learning was .91, the mean ICC [1] = .10, the mean ICC[2] = .36, and  $r_{wg}$  of .85. The Cronbach alpha for process learning was .86, ICC [1] = .06, ICC [2] = .22,  $\eta^2 = .39$ , and the  $r_{wg}$  was .72, which are acceptable aggregation values for team research (LeBreton & Senter, 2008).

**Customer satisfaction.** In line with previous research (e.g., Mathieu et al., 2006) customer satisfaction was measured by an independent research agency, which coordinates the yearly customer satisfaction surveys for this grocery store chain. This agency yearly sends a survey to a random sample of customers to yield a representative sample for each store managed by each team. We received the total means on customer satisfaction ratings per store for 65 out of the 68 stores in total. In the customer satisfaction survey, customers were asked to rate the extent to which superior customer service and quality of products and services had been achieved, rating 18 items using a 10 point scale ranging from 1 (highly insufficient) to 10 (perfect). For example, customers were asked to rate the service, helpfulness, and friendliness of the floor managers, the tidiness of the store, their satisfaction with the quality and variety of products, and their overall satisfaction with the store. The research agency then converted their ratings into 20-100 percent indexes. These composite indexes, per team

Table 1. *Factor Loadings of Constructs*

	1	2	3	4
<b>Perceived Subgroups</b>				
1. I feel that there are (different) subgroups in my team.	<b>.87</b>	.03	-.10	.00
2. While we work the team divides into different subgroups.	<b>.86</b>	.07	.02	-.09
3. People from the same subgroups are consort with each other more often.	<b>.85</b>	.02	.05	.07
4. During the work I am often aware of the presence of different subgroups in our team.	<b>.85</b>	-.12	.03	.11
5. During the work subgroups emerge within the whole team.	<b>.84</b>	-.09	.00	.06
6. My team often splits into subgroups while we work.	<b>.77</b>	.00	-.06	-.17
7. During a lunch or social hour people from the same subgroup often talk with each other.	<b>.75</b>	.04	.03	.11
8. During team meetings subgroups are often sitting together	<b>.74</b>	.05	.02	-.01
<b>Social learning</b>				
1. Because we know each other personally, we increase our potential to perform as a team.	-.04	<b>-.85</b>	.08	.06
2. As a team we improve our performance by knowing each other personally.	-.11	<b>-.84</b>	-.02	-.03
3. We learn from each other about non-work related matters.	-.09	<b>-.75</b>	.20	.08
4. As a team, we learn about the social relationships in our team.	-.03	<b>-.75</b>	.15	-.02
5. We regularly have lunch or organize drinks together as a team to get to know each other better personally.	-.02	<b>-.75</b>	-.10	-.09
6. As a team, we often go to outings or social activities to get to know each other better.	.11	<b>-.69</b>	-.11	-.04
7. During lunch or drinks we get to know each other more personally.	.12	<b>-.67</b>	-.05	-.09
<b>Task Learning</b>				
1. By reflecting upon knowledge about the task we improve our performance.	.06	.14	<b>.84</b>	-.06
2. Through sharing insights with each other we learn as a team about the content of the task.	.00	.02	<b>.84</b>	-.08
3. By working together as a team, we learn more about the content of the task.	.02	.02	<b>.83</b>	-.11
4. As a team, we improve our performance by learning about the task.	-.05	-.16	<b>.81</b>	.16
5. Through interaction with each other we increase our potential to perform the task.	-.06	-.08	<b>.77</b>	-.07
<b>Process Learning</b>				
1. We regularly reflect on our work procedures to see how we can improve them.	-.04	.00	.12	<b>-.78</b>
2. In our team, we learn about different ways to do our work.	-.05	-.10	-.01	<b>-.75</b>
3. We adjust our work processes when they are no longer effective.	-.11	.13	-.01	<b>-.71</b>
4. As a team, we develop work routines that help us to improve the performance of our work.	.05	-.14	-.06	<b>-.70</b>
5. We improve our performance by reflecting upon the way we do our work	.11	-.05	.20	<b>-.67</b>
6. By talking about the way we do our work, we learn to improve our performance.	-.02	-.14	.24	<b>-.60</b>

Note. Extraction method: Principal Component Analysis. Rotation method: Oblimin with Kaiser Normalization

per year, of this measure were made available to us for this study ( $M = 53.05$ ,  $SD = 6.60$ , range 39.9 to 70.2).

**Control Variables.** We controlled for heterogeneity based on gender, age, and educational level. We calculated the coefficient of variation for age and educational level and used Teachman's Entropy index (1980) for calculating gender heterogeneity ( $\sum [pk \times \ln(pk)]$ , where  $p$  is the proportion of unit members in the  $k$ th category). Following past research (e.g., Jehn et al., 1999; Van der Vegt & Janssen, 2003), we averaged these scores together to create an overall demographic diversity measure. In addition, we controlled for group size and team tenure.

## Results

Table 2 includes the means, standard deviations, and correlations among the variables in our study. We found a strong negative correlation between faultlines and process learning, giving support for hypothesis 1b. To test our hypotheses, we conducted hierarchical group-level regression analyses (see Table 3) and centralized our variables, as recommended by Aiken and West (1991).

Table 2. Means, Standard Deviations and Correlations Between the Variables

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Group Size	4.59	1.02	-								
2. Team Tenure	2.32	1.70	-.04	-							
3. Team Heterogeneity	.37	.09	.31†	-.29†	-						
4. Faultlines	.62	1.08	-.26	.03	.20	-					
5. Perceived Faultlines	3.16	.89	.20	.08	.35*	-.03	-				
6. Social Learning	4.03	.72	.20	-.03	.00	-.04	.20	-			
7. Task Learning	5.58	.49	-.14	-.15	-.22	-.25	-.11	.34*	-		
8. Process Learning	5.29	.64	-.05	-.14	-.15	-.48**	.08	.42**	.45***	-	
9. Customer Satisfaction	53.05	6.60	-.15	.25	-.15	.03	-.16	-.16	.05	.25	-

Note. †  $p < .10$ , \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

In our first hypothesis, we proposed that faultlines were negatively associated with task learning. Regression analysis did not show a significant effect of faultlines on task learning ( $\beta = -.25, p = ns$ ; see Table 3), indicating that strong faultline groups did not have lower levels of task learning than weak faultline groups. Hypothesis 1b proposed that faultlines were negatively associated with process learning. Regression analysis showed a significant main effect of faultlines on process learning, ( $\beta = -.79, p < .001$ ; see Table 3), indicating a strong negative effect of faultlines on process learning. Groups with strong faultlines had low levels of process learning, supporting hypothesis 1b. Hypothesis 1c, proposing that faultlines would be negatively associated with customer satisfaction, was not supported.

We found support for our second hypothesis, proposing that perceptions of faultlines would moderate the relationship between objective faultlines and customer satisfaction, and task and process learning, such that when team members perceived demographic subgroups, the relationship between faultlines and team outcomes is strengthened. Perceived faultlines indeed enhanced negative faultline effects, and this affected two outcomes: customer satisfaction and process learning. Regression analysis showed a significant interaction between objective and perceived faultlines on customer satisfaction ( $\beta = -.51, p < .05$ ). The plot displayed a cross-over interaction effect, showing that when objective faultlines were perceived, customer satisfaction rated the service significantly lower than when faultlines were not perceived by team members (see Figure 2).

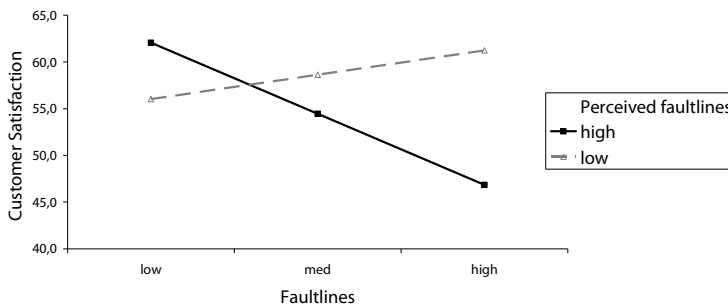


Figure 2. Moderation Perceived Faultlines on Faultlines to Customer Satisfaction

Table 3. Hierarchical Linear Regression Results

	<b>Task Learning</b>	<b>Process Learning</b>	<b>Customer Satisfaction</b>
	$\beta$	$\beta$	$\beta$
<b>Step 1</b>			
<b>Controls</b>			
Group size	-.35†	-.48**	-.32
Team tenure	-.19	-.09	.27
Team heterogeneity <sup>1</sup>	-.22	.16	.10
<b>Step 2</b>			
<b>Main effects</b>			
Demographic Faultlines <sup>1</sup>	-.25	-.79***	-.26
Perceived Faultlines <sup>1</sup>	-.02	-.05	-.21
Social learning	.34*	.47**	-.10
<b>Step 3</b>			
<b>Interaction effects</b>			
Demog Fau x Perc Fau	-.24	-.40**	-.51*
Demog Fau x Social learning	.54**	-.27†	-.01
$R^2$	.59	.65	.31
$F$	3.83**	4.86**	1.10

Notes. <sup>1</sup> based on gender, age, educational level

†  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

Additionally, regression analyses showed a significant interaction effect between objective and perceived faultlines on process learning ( $\beta = -.40$ ,  $p < .01$ ), indicating that the negative effect of faultlines on process learning was strengthened when team members perceived faultlines (for the interaction plot see Figure 3).

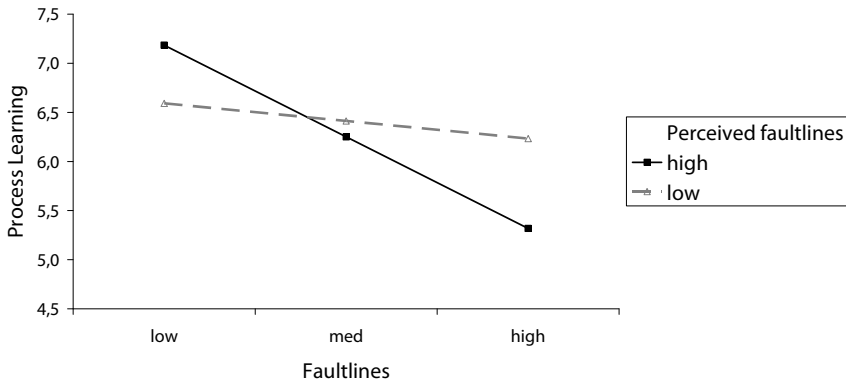


Figure 3. Moderation Perceived Faultlines on Faultlines to Process Learning

Our results partially supported our moderation hypothesis 3, proposing that social learning would weaken the negative relationship between faultlines and team outcomes. We found a positive interaction between faultlines and social learning on task learning ( $\beta = .54, p < .01$ ). In line with what we proposed, faultline teams with high levels of social learning had significantly higher levels of task learning than faultline teams with low levels of social learning (see Figure 4). The cross-over interaction showed that, in fact, when team members knew each other well through social learning, faultlines did not negatively impact task learning, while it did when there were low levels of social learning.

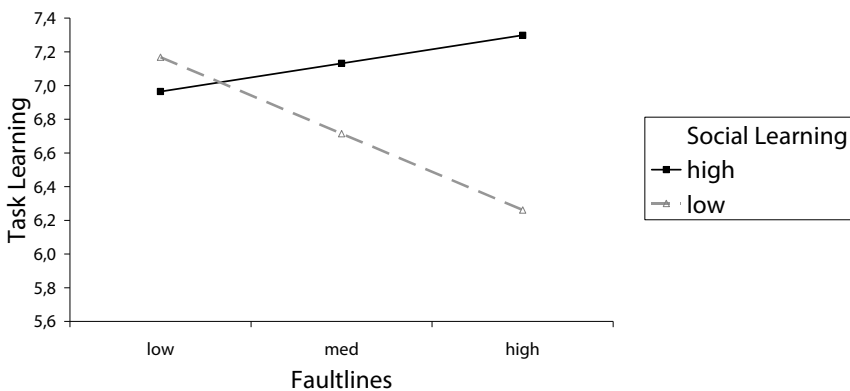


Figure 4. Moderation Social Learning on Faultlines to Task Learning.

## Discussion

In this study, we contributed to past faultline literature by examining the impact of faultlines on two different types of outcomes: team learning as a team outcome internal to the team and customer satisfaction coming from an external source. We investigated two different types of team learning as outcome variables: task and process learning. In line with what we proposed, we found that faultlines were strongly associated with lower levels of process learning. Additionally, we extended past faultline research by examining the moderating role of perceived faultlines and a potential faultline de-activator: social learning. We found support for our activation hypothesis, showing that faultlines had a negative impact on customer satisfaction when team members actually perceived the faultlines in their team. In line with this, when team members were aware of the faultlines in their team, the negative impact of faultlines on process learning was strengthened. Additionally, we found support for our hypothesis that social learning would de-activate faultlines. Faultline groups showed higher levels of task learning, when the team displayed high levels of social learning.

## Theoretical Implications

In this study we found that process learning was most strongly affected by potential and activated faultlines. Process learning is learning about work routines that are effective and adjusting work processes, according to what is effective. This finding is in line with the notion that teams mostly suffer from process and coordination losses (Steiner, 1972). Another reason why we found stronger effects for process learning than for task learning might be related to the type of work the teams in this study performed, which was not very cognitively and knowledge intensive, but was more complex with regard to coordination and management processes. Therefore, process learning in these teams might have been more important than task learning. Future research should therefore study teams with a cognitive and knowledge intensive task to see whether faultlines in these teams are also differently related to task and process learning.

Faultlines also had a negative impact on customer satisfaction, but only when faultlines were perceived, giving support for our activation hypothesis.



The fact that faultlines had to be activated in order to influence customer satisfaction, while potential faultlines directly influenced process learning, could be related to the fact that customers' ratings of satisfaction with the service in the store are more distant from team processes and interactions than the internal team outcome of process learning. Team learning is more closely related to team processes and more likely to be directly influenced by objective faultlines, as our findings showed. In fact, one could argue that, especially for external team outcomes, it is a precondition that faultlines must be activated in the minds of individual team members in order to disrupt team functioning to the extent that customers will notice it. A recommendation for future research would be to investigate the underlying mechanisms which drive faultline activation effects for internal versus external team outcomes, such as process learning and customer satisfaction. As we proposed, for customer satisfaction the underlying process could be a process of emotional contagion (Pugh, 2001). For process learning, in turn, it would be interesting to see whether psychological safety (Edmondson, 1999) mediates the relationship between activated faultlines and this outcome measure.

In line with what we proposed, we also found that social learning has the potential to de-activate faultlines and therefore can act as social glue. When we look at the interaction plot (see Figure 4), there seems to be a trend that when social learning is high, faultlines are even transformed into healthy divides (Gibson & Vermeulen, 2003), leading to more task learning. It might be the case that when team members know each other well, they are more likely to come up with and share task relevant insights and ideas, which improves the team's performance.

A notable finding in our study was that task and process learning were not related to customer satisfaction, while literature suggests that team learning is related to improved performance (e.g., Wilson et al., 2007). However, customer satisfaction might be too far removed from processes such as team learning. Also, we measured the extent to which team members perceived that their team learned which can be different from the actual learning that a team does. So future research should collect objective measures of team learning, to see whether a team has actually learned and how this affects objective outcomes such as customer satisfaction. Another explanation could be that there are moderators which specify the conditions under which team learning is related to customer satisfaction, such as what phase of learning the team is in, how important learning is to the team, and how much time they spend on team

learning. We suggest that future research should measure and control for these types of moderators.

## **Managerial Implications**

The results of this study illustrate the importance of a groups' composition for team learning and performance. Therefore, managers should take team members demographics into consideration. As past research has shown, team members can improve group performance through the exchange of different perspectives (Van der Vegt & Bunderson, 2005). However, as this study shows, it is important that team members are not too different from each other, based on multiple dimensions. When creating a group of senior, experienced people combined with relatively inexperienced junior members who need to learn, it is more effective when the seniors overlap in some way with the junior people, for instance based on their gender or expertise field. This study also showed that potential and perceived faultlines were most detrimental for process learning and that the latter can also affect outcomes outside of the team, such as customer satisfaction. When customers are dissatisfied this can influence financial profit and growth in the end as well. A good process leader could prevent that coordination losses occur by helping them to coordinate their activities.

Additionally, to promote task learning, managers should facilitate social learning within the team. This study showed that social learning can act as a social integration mechanism in faultline teams, weakening the negative impact of faultlines on task learning. Managers could facilitate social learning by organizing social hours, team outings, and by creating a comprehensive team culture in which social learning is being valued. This will stimulate team members to share personal information with each other, which can in turn facilitate task learning.

Managers could also weaken the faultline activation process, by promoting the identification of team members with their superordinate team identity (Lipponen, Helkama & Juslin, 2003; Gaertner, Dovidio, Nier, Ward & Banker, 1999). Through a process of faultline activation, team members are more likely to identify with their subgroup in the team, but this identification can be shifted towards a higher level, such as the superordinate team identity. A strong workgroup identity decreases the likelihood that activated faultlines lead to subgroup formation and conflict (Thatcher & Zhu, 2006; Van Vugt & Hart,

2004) Therefore, managers should promote the identification with the superordinate team identity, by emphasizing the common team identity.

## Limitations and Future Research Directions

Following past research on faultline strength and distance, we calculated an overall group faultline score including faultline strength and distance (see Bezrukova et al., 2007). This overall group faultline score has some limitations, since it does not allow us to examine the exact interplay between faultline strength and faultline distance. An advantage of this approach, however, is that we are able to test our hypotheses with a smaller sample size than would be required to do the full analyses. We still must consider that recent research suggests that faultline strength may vary according to different levels of faultline distance (Bezrukova et al., 2009). To test this possibility, we did some preliminary analyses in which we controlled for the main effects of faultline strength and distance and calculated 2-way interactions to test hypothesis 1 and 3-way interactions to test hypothesis 2 and 3. These preliminary results support our prediction that faultlines would be negatively associated with task and process learning, but particularly in the situation of high distance (e.g., a 4-person group consisting of two 20-year-old females and two 50-year-old males). When distance was low (e.g., a 4-person group consisting of two 20-year-old females and two 30-year-old males), faultline strength had either no effect (i.e. task learning) or even positive effects (i.e. process learning). In line with what we hypothesized, the perceptions of faultlines worsened the effect of faultline strength on process learning and customer satisfaction, but again, only when distance was high. Social learning helped reduce the effects of faultline strength, especially in the situation of high distance. Future research should therefore consider that the effects of faultline strength may vary according to different levels of distance and test this possibility using an appropriate sample (see e.g., Bezrukova et al., 2009).

Another limitation of this study is its cross-sectional nature, which limits us in drawing causal inferences about the relationship between diversity faultlines and team learning. Therefore, future research should collect longitudinal data on workgroups and/or test this relationship in an experimental setting. Additionally, the faultline scores in our sample had a limited range (.43 to .98) in which the very weak faultlines (which could be either highly homogeneous or highly heterogeneous groups) were

underrepresented. Future research should collect data with a wider range of faultline score to get more insight in the processes and outcomes of very weak faultline groups. With regard to the measure of perceptions of faultlines it would be interesting for future research to look at asymmetries in perceptions of faultlines and how these asymmetries affect group processes and performance. For instance, research has found (Jehn, Rispens & Thatcher, in press; Jehn, Rupert & Nauta, 2006) that asymmetries in perceptions of conflict can have detrimental effects on group outcomes and conflict resolution through mediation. Similarly, one can imagine that groups in which members differ in their perception of faultlines will have different group dynamics than groups in which all members perceive the same level and type of faultlines.

In this study we found that faultlines were differently related to types of team learning. This could be related to the diversity characteristics that faultlines can be based on. For this study, we were able to collect full demographic information on gender, age, and educational level, which are characteristics originally proposed by Lau and Murnighan (1998) and commonly measured in several faultline studies (e.g., Barkema & Svyrov, 2007, Gibson & Vermeulen, 2003; Thatcher et al., 2003). However, it would be interesting if future research would collect data on more characteristics and see whether faultlines based on different types of diversity, such as informational versus social category diversity (Harrison et al, 1998; Jehn et al., 1999; Milliken & Martins, 1996), promote different mechanisms, which could explain the effects on team learning types. For instance, social category faultlines could be more likely to set in motion stereotypes and prejudice, resulting in intersubgroup relationship conflict, which might negatively impact both process learning and social learning, while informational faultlines could act as healthy divides under certain circumstances (cf. Jehn, Greer, & Rupert, 2008), promoting constructive task discussions and task learning as a result.

## **Conclusion**

In this field study of shop floor management teams, we investigated the relationship between faultlines and both internal and external outcomes: team learning and customer satisfaction. We examined two moderators: one faultline enhancer, which is faultline perceptions, and one faultline de-activator, which is social learning. We hypothesized and found that faultlines negatively influenced team learning. Perceptions of faultlines strengthened the effects of

faultlines, which was associated with lower levels of customer satisfaction and process learning. Social learning de-activated faultline effects on task learning, such that strong faultline teams had higher levels of task learning when social learning was high.