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Abstract

Faultline theory suggests that negative effects of team diversity are better understood by considering the influence of different dimensions of diversity in conjunction, rather than for each dimension separately. We develop and extend the social categorization analysis that lies at the heart of faultline theory to identify a factor that attenuates the negative influence of faultlines: the extent to which the team has shared objectives. The hypothesized moderating role of shared objectives received support in a study of faultlines formed by differences in gender, tenure, and functional background in 42 top management teams. The focus on top management teams has the additional benefit of providing the first test of the relationship between diversity faultlines and objective indicators of organizational performance. We discuss how these findings, and the innovative way in which we operationalized faultlines, extend faultline theory and research as well as offer guidelines to manage diversity faultlines.

Keywords

diversity, faultlines, functional background diversity, gender diversity, social categorization, social identity, teams, tenure diversity, top management teams

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Diversity is increasingly recognized as a key characteristic of teams in organizations (Harrison and Klein, 2007; Jackson et al., 2003). This has also brought growing recognition of the fact that diversity may have positive as well as negative effects on team performance, and that the way forward in studying and managing diversity is a better understanding of the contingencies of these effects (van Knippenberg and Schippers, 2007). Research on the negative effects of diversity in particular has a long history of inconsistent research findings, however (Williams and O'Reilly, 1998), inspiring calls for more sophisticated models of diversity that are better able to predict when diversity is negatively associated with team performance (van Knippenberg et al., 2004a). One promising answer to this call is found in the development of faultline theory (Lau and Murnighan, 1998), which suggests that the negative influence of team diversity is better understood by considering the influence of different dimensions of diversity in conjunction, rather than the influence of each dimension separately.

We develop and extend faultline theory and research in three distinct ways. First, addressing both the question of when and why diversity has negative effects and of how to manage diversity faultlines, we extend the social categorization analysis that lies at the heart of faultline theory to identify a factor that attenuates the negative influence of faultlines: the extent to which the team has shared objectives (Anderson and West, 1998). Second, we introduce a more refined measure of diversity faultlines that is more informative about the diversity dimensions involved in driving faultlines' influence than previous measures and that thus may inspire more accurate hypothesis development and testing. Third, we test the moderating role of shared objectives in the faultline-performance relationship in a sample of top management teams, which allows us to conduct a first test of the relationships between diversity faultlines and objective indicators of organizational performance.

Theoretical background and hypotheses

Diversity refers to the degree to which there are similarities and differences between members of a team or group (Jackson et al., 2003). While in principle diversity could apply to any dimension of differentiation, in practice research in organizational diversity has focused primarily on diversity in gender, age, ethnicity, tenure, and functional background (Milliken and Martins, 1996; van Dijk et al., 2009). Regardless of the attributes under consideration, however, the primary question in diversity research has always been how diversity affects team performance. In this respect, diversity has been conceptualized both as a source of information, knowledge, and expertise (cf. diversity as variety; Harrison and Klein, 2007) that may benefit the team, and as a factor inviting subgroupings within the team (cf. diversity as separation; Harrison and Klein, 2007) that may disrupt team process and performance (van Knippenberg and Schippers, 2007; Williams and O'Reilly, 1998).

There is evidence for both these outcomes of diversity and this evidence holds across dimensions of diversity (van Knippenberg and Schippers, 2007). Despite its intuitive appeal to many, there is only limited support for the notion that the positive versus the negative effects of diversity are uniquely linked to specific types of diversity (e.g. functional vs demographic). Indeed, although recent meta-analyses suggest that functional background

diversity may be more likely to have a positive than a negative association with performance, while demographic dimensions of diversity may be more likely to be negatively related to performance (Horwitz and Horwitz, 2007; Joshi and Roh, 2009), a substantially more comprehensive meta-analysis emphasizes the heterogeneity of these effects and provides important qualifications to these earlier conclusions that highlight it is not possible to link uniquely the negative or the positive effects of diversity to specific subsets of diversity dimensions (van Dijk et al., 2009). Rather, the issue seems to be to identify moderators of the diversity–performance relationship (van Knippenberg and Schippers, 2007).

To this end, van Knippenberg et al. (2004a) proposed the Categorization-Elaboration Model (CEM). The CEM integrates and extends perspectives on the positive and negative effects of diversity among others through a more sophisticated understanding of the social categorization processes involved – the processes associated with the negative effects of diversity. These effects are particularly relevant to diversity management, in that the CEM identifies them not only as undesirable in and of themselves, but also as disrupting the information elaboration process (i.e. exchange and integration) that underlies the positive effects of diversity. Preventing these negative effects therefore is a necessary, albeit it not sufficient, condition to harvest the potential benefits of diversity (i.e. in the absence of disruptive social categorization processes, information elaboration is not self-evident, but contingent on influences stimulating elaboration). These key propositions of the CEM are supported in both experimental and field research (e.g. Homan et al., 2007a, 2008; Kearney and Gebert, 2009; Kearney et al., 2009; Kooij-de Bode et al., 2008; van Knippenberg and van Ginkel, 2010; see also Phillips et al., 2006; Sawyer et al., 2006). The CEM thus emphasizes that a key focus in diversity research and practice should be an understanding of social categorization processes, both in terms of preventing the negative effects of diversity and in terms of creating the preconditions for the positive effects of diversity. Accordingly, in the present study we build on the analysis advanced in the CEM to extend our insights in the social categorization processes underlying the negative effects of diversity.

Diversity faultlines

An important theme within the diversity literature is that team processes should typically run more smoothly when the team is less diverse. The social categorization perspective in diversity research (van Knippenberg and Schippers, 2007; Williams and O'Reilly, 1998) suggests that differences between people may engender subgroupings within a team that differentiate similar, ingroup, members from dissimilar, outgroup, members (i.e. 'us and them'). People typically prefer working with similar (ingroup) others, trust similar others more, and are more willing to cooperate with similar others than with dissimilar (outgroup) others (Brewer and Brown, 1998; Tajfel and Turner, 1986). An important consequence for collaboration in teams and work groups is that group members are also more open to communication with others seen as ingroup (van Knippenberg et al., 2004a). As outlined in the CEM, subgroupings engendered by diversity might thus disrupt a team's exchange and integration of information – a process that is critical to the performance of teams dealing with non-routine, knowledge-intensive work such as top management teams (TMTs), R&D teams, and cross-functional project teams. Accordingly,

under the influence of social categorization processes, homogeneous teams may function more smoothly and harmoniously and communicate more effectively than more diverse teams in which differences engender subgroupings.

Clearly, however, as narrative reviews and meta-analyses make clear, these disruptive influences do not always happen. A key question therefore is what moderates this negative impact of diversity on performance. In answer to this question, the CEM builds on key insights from research in social categorization regarding the *salience* of social categorizations. Research in categorization salience shows that it is the salience (i.e. cognitive activation; Turner et al., 1987) of categorizations that drives subgrouping effects and that there is no one-on-one relationship between differences between team members and categorization salience. That is, greater diversity does not necessarily result in stronger categorization processes and the same diversity may be more or less problematic, contingent on the triggers of categorization salience (Lau and Murnighan, 1998; Pearsall et al., 2008; Randel, 2002). An important implication of this insight is that to predict the categorization effects of diversity we should focus on factors influencing categorization salience and not just on the degree to which there are differences between team members (van Knippenberg et al., 2004a). This is the perspective we adopt and extend in the present study.

In analyzing the salience of subgroupings in diverse teams, the CEM relies on self-categorization theory and its identification of the determinants of categorization salience (Turner et al., 1987). The self-categorization perspective holds that because categorizations are used to make sense of the world by capturing similarities and differences between people, a potential categorization is more likely to be salient the higher its *comparative fit*, that is, the more it results in groupings with high within-group similarity and high between-group difference. The notion of comparative fit has an important implication for diversity research. Diversity on any given dimension may have dramatically different effects depending on whether differences on the dimension converge with differences on other dimensions or not. The more the positions on two dimensions of diversity are correlated (e.g. the more the male members of a team also tend to be the older members of the team), the higher the comparative fit of a categorization in terms of these dimensions (e.g. older men vs younger women), and the more likely this subgrouping is to be salient and to disrupt team process and performance. Conversely, when differences on one dimension cut across differences on another (e.g. age and gender are uncorrelated), this lowers comparative fit and thus the salience of potential subgrouping. This is an influence that could never be uncovered by the traditional focus on separate dimensions of diversity and thus is an important extension of the social categorization perspective on diversity.

Lau and Murnighan (1998) proposed the term *faultlines* to refer to combinations of differences that may render subgroupings salient. In support of the analysis in terms of categorization salience, evidence is accumulating that faultlines may indeed be negatively related to team process and performance (e.g. Homan et al., 2008; Lau and Murnighan, 2005; Molleman, 2005; Sawyer et al., 2006). These studies have also shown that the influence of faultlines is not limited to particular dimensions of diversity (e.g. demographics) but also extends to more deep-level, informational differences (Bezrukova et al., 2009; Homan et al., 2007b). Moreover, these studies supported the proposition of the CEM that the disruptive influence of faultlines revolves around their detrimental

effect on information elaboration (Homan et al., 2007b, 2008). This evidence that it is not so much diversity per se that is problematic but rather combinations of diversity dimensions that result in strong faultlines begs the question of how to manage faultlines, or in more conceptual terms, which influences may attenuate the negative relationship between faultlines and performance.

Whereas faultline research initially focused on establishing the disruptive influence of faultlines, more recently research has started to engage with moderators of the relationship between the strength of faultlines (i.e. the extent to which positions on different dimensions of diversity are correlated within a team) and performance. Rico et al. (2007) showed that team autonomy exacerbates the negative impact of faultlines, presumably because a greater need for team communication (cf. information elaboration) associated with greater autonomy makes the influence of faultlines more apparent (cf. Molleman, 2005). Speaking more to the categorization dynamics underlying faultlines, Bezrukova et al. (2009) showed that faultlines are more disruptive the greater the difference between subgroupings (cf. comparative fit), and also obtained some evidence that faultlines may be less problematic the more members identify with the team (which was also interpreted in terms of comparative fit).

The present study fits within this emerging stream of research and extends faultline research in three important ways. First, as highlighted in the CEM, faultlines represent only one of the factors governing salience (i.e. comparative fit). The present study makes an important conceptual contribution by further developing the salience perspective in diversity. In doing so, it identifies a factor attenuating the influence of faultlines (i.e. shared objectives). Second, approaches to the operationalization of faultlines have confounded multi-dimensional faultlines with their constituent parts, potentially giving rise to erroneous conclusions. We propose an approach to faultlines that addresses this shortcoming of earlier studies and that we argue should set the standard for future studies – and moreover introduce the first faultline measure that maintains the continuous nature of interval variables like tenure and age (i.e. which is important to avoid artificial dichotomies that may result in a misspecification of faultline strength). Third, when focusing on the team that is responsible for the performance of the organization as a whole, the top management team (TMT), faultlines may be seen as a negative influence on the performance of the organization as a whole (Li and Hambrick, 2005), and the current study is the first to establish relationships between (TMT) faultlines and objective indicators of organizational performance.

Shared objectives

Insights into the factors driving the salience of categorizations made it possible to identify the role of faultlines in the diversity–performance relationship. These insights may also be used to identify attenuating influences in this relationship. Faultlines disrupt performance because they render subgroupings salient through the principle of comparative fit, but this is not the only factor governing salience. Based on self-categorization theory (Turner et al., 1987), the CEM identifies *normative fit* as a second major influence on categorization salience. Normative fit captures the extent to which a categorization makes sense within individuals' subjective frame of reference (Turner et al., 1987). That

is, categorization salience is not just a matter of the extent to which the categorization provides 'a good summary of the data' in capturing within-group similarities and between-group differences, but also of the extent to which the categorization is subjectively meaningful – categorizations that are subjectively meaningful are more likely to be salient. Societal gender stereotypes may, for instance, give subjective meaning to a gender categorization (cf. Pearsall et al., 2008), whereas a categorization in terms of body length may seem meaningless in most organizational contexts (even when it would capture differences between team members equally well as a gender categorization; i.e. given similar comparative fit).

The principle of normative fit may be employed to identify factors that attenuate the disruptive influence of diversity faultlines. From a salience of categorizations perspective, faultlines are problematic because they increase the salience of subgroupings in the team at the expense of the salience of the categorization as one team (Earley and Mosakowski, 2000). From this perspective, what would be required to counteract the influence of faultlines is an influence that increases the salience of the categorization as one team and thus distracts from subgroupings in the team (cf. Gaertner et al., 1993; van Knippenberg, 2003). In terms of normative fit, what would be required is an influence associated with the subjective meaningfulness of the categorization as one team (note that the principle of normative fit could also involve influences that render subgroupings less subjectively meaningful, but given the formal nature of the team versus the emergent, spontaneous nature of subgroupings, a focus on the team is more obvious from a managerial perspective at least). From the perspective of teams and work groups in organizations, such influence would probably lie first and foremost in the very raison d'être of the team – the objectives it is there to achieve.

While all organizational teams exist for a reason, there may be important differences between teams in the extent to which these objectives are clear and shared among team members. Such differences may arise independently of team composition, for instance as a result of the team's leadership or under the influence of external (e.g. market) factors that may render objectives more clear and obvious. The concept of *shared objectives* (Anderson and West, 1998) captures this, referring to the extent to which the team is committed to clear and shared objectives. Shared objectives can be seen as important in team effectiveness, because they offer a shared focus that guides team process and provides reference points for team self-regulation (Kozlowski and Bell, 2003). While the concept of shared objectives was not developed to address the issue of subgroupings within teams, it aligns very well with the analysis in terms of normative fit and the subjective meaningfulness of the categorization as one team. It also connects well with the related notion of a shared intergroup goal identified in early research in intergroup relations (Sherif, 1966), which may be interpreted as an influence counteracting the salience of subgroupings by rendering the categorization as one group more salient (van Knippenberg, 2003). Moreover, by providing clear focal points in shared objectives, shared objectives may also be associated with team communication processes that are guided and structured by these objectives, thus rendering subgroupings less subjectively relevant to such communication (cf. van Knippenberg, 1999). In short, shared objectives may render the shared team membership more salient and thus subgroupings less salient, and therefore attenuate the relationship between faultlines and organizational performance.

Study hypotheses: TMTs, decomposition of faultlines, and organizational performance

To put our analysis to the test, we focused on diversity faultlines in top management teams (TMTs) – the team of senior managers around the company's CEO. While there is no reason to see TMTs as qualitatively different from other teams studied in diversity research (cf. van Dijk et al., 2009; van Knippenberg et al., 2004a), TMT diversity is a particularly interesting case because its influence can be studied in relationship with the performance of the organization as a whole (Carpenter et al., 2004; Hambrick and Mason, 1984). Preliminary evidence for the role of faultlines in TMTs can be found in Li and Hambrick's (2005) findings that faultlines in joint venture management teams were negatively related to subjective perceptions of performance. Subjective perceptions should not be equated with objective indicators of performance, however (Bommer et al., 1995), especially not in diversity research where diversity itself may introduce biases in performance ratings (van Dijk et al., 2009), and a contribution the current study makes is that it provides the first test of the relationship between faultlines and objective indicators of organizational performance.

While the present study is the first to establish a link between TMT faultlines and objective indicators of organizational performance, the rationale to expect such a relationship is in line with the more general analysis of faultlines. When faultlines invite subgroupings within the TMT, this will disrupt effective team communication and collaboration, and in particular the process of information elaboration that is crucial to performance in teams dealing with complex problems and decisions, non-routine challenges, and a great variety of complex information. For TMTs this could, for instance, mean that faultlines cause teams to arrive at less optimal solutions to problems, less competitive strategic decisions, and less innovative policies than they could have reached without this disruptive influence. These outcomes of team elaboration processes are all likely to be reflected in the bottom line financial performance of the company (Carpenter et al., 2004; Hambrick and Mason, 1984).

Our conceptual analysis concerns fundamental principles underlying the influence of diversity and accordingly we aimed for our study to speak broadly to diversity research. We therefore focused our analysis on attributes that are representative for research in TMT diversity and in diversity at large. Diversity research has mainly revolved around diversity in gender, age, tenure, ethnicity, and functional background. Ideally, we would therefore focus on these five dimensions. Two complications, however, led us to reduce our focus to three of these: gender, tenure, and functional background. First, age and tenure are typically too highly correlated to include in the same analysis (i.e. it takes a certain age to achieve a certain tenure even when low tenure does not necessarily imply young age). We therefore opted to focus on tenure as this speaks more broadly to the TMT literature (Carpenter et al., 2004). Second, the reality of TMTs in many industries is that there are virtually no members with an ethnic minority background (Sangler-Grant and Schneider, 2004), and the current sample was no exception, precluding the possibility to study ethnic diversity.[1]

Functional background diversity has been studied extensively inside and outside the TMT domain, and is the dimension of diversity often associated most with the informational benefits of diversity (Horwitz and Horwitz, 2007; Joshi and Roh, 2009). Even so, functional background diversity arguably also is a basis for subgroupings (van Knippenberg

et al., 2004a) and relationships between functional background diversity and performance vary considerably for TMTs as well as for other teams (van Dijk et al., 2009). In TMTs, for instance, research has yielded both positive and negative relationships between functional background diversity and performance as well as null findings (e.g. Hambrick et al., 1996; Knight et al., 1999; Smith et al., 1994). While it is clear that functional background diversity may be related to (TMT) performance, there thus clearly is scope for a more sophisticated analysis of some of the contingencies involved (see Cannella et al., 2008).

The picture for tenure diversity looks similar. Tenure diversity may be a source of information as different 'generations' within the team may develop different perspectives through different experiences, but such differences may also feed into subgroupings (van Knippenberg et al., 2004a). Not surprisingly, findings for tenure diversity vary substantially across studies (van Dijk et al., 2009) and TMT tenure diversity is no exception (e.g. Bunderson and Sutcliffe, 2002; Hambrick et al., 1996). Here too, the conclusion seems justified that there is scope for further analysis of some of the contingencies involved.

Research in gender diversity likewise suggests a range of effects (van Dijk et al., 2009) consistent with the notion that gender diversity may both be associated with valuable differences in experience, information, and perspectives, and form a basis for subgroupings (van Knippenberg et al., 2004a). The study of TMT gender diversity is somewhat of a special case, however. Few studies have examined TMT gender diversity, presumably mainly because women are vastly underrepresented in TMTs (Sealy et al., 2008; Welbourne et al., 2007). This implies that any study of TMT gender diversity is confronted with a restriction of range in the diversity considered – essentially studying a range from all-male teams to teams with one or at best only a few female members (see Kanter, 1977). While such restriction of range provides a qualification of the conclusions drawn, it is no reason not to study gender diversity, especially when the restriction of range is representative of the population studied (Harrison and Klein, 2007). Likewise, the low number of women in TMTs does not preclude the meaningful study of faultlines involving gender – even a minority of one can form a basis for a faultline that has a disruptive effect on group performance (Sawyer et al., 2006).

While controlling for faultlines (i.e. presumably controlling for disruptive subgroupings) there may be little reason to expect diversity in tenure, gender, or functional background to be negatively related to performance, faultlines formed by combinations of functional background, tenure, and gender differences may be expected to be negatively related to organizational performance. We should be open, however, to the possibility that not all faultlines are created equally, and our study also makes a contribution to faultline research through the approach to faultlines we adopted in this respect.

Faultlines are typically operationalized by an index that reflects the extent to which positions on different dimensions of diversity are correlated, where perfect correlations represent perfect faultlines (Shaw, 2004; cf. Thatcher et al., 2003). Prior research has adopted faultline measures that represent the extent to which there is a faultline based on a combination of all the dimensions of diversity studied (e.g. Thatcher et al., 2003). When studying more than two dimensions of diversity, however, a meaningful distinction can be made between faultlines formed by only two dimensions of diversity and faultlines formed by three or more dimensions of diversity. Using a single faultline measure that

combines all dimensions of diversity obscures the contribution of different dimensions to creating faultline effects. This may lead to the erroneous conclusion that multiple dimensions in combination exert an influence whereas in reality it is only the combination of a subset of these dimensions that affects outcomes. In the present study, in contrast, we decomposed faultlines into faultlines formed by two dimensions (i.e. two diversity attributes) and the faultline formed by all three dimensions (i.e. all three diversity attributes studied). That is, where previous research would only focus on the functional background by tenure by gender faultline, we also studied the functional background by tenure, functional background by gender, and tenure by gender faultlines. This decomposition in two-dimensional and three-dimensional faultlines prevents erroneous attributions of influences of two-dimensional faultlines to the three-dimensional faultline.

This is no trivial point, as the normative fit principle also suggests that faultlines composed of some attributes may be more likely to invite subgroupings than others. While the principle of comparative fit would suggest that faultlines of equal strength are equally disruptive to performance, some convergences of differences may be more likely to be salient than others because of greater normative fit. In this respect, gender may be expected to be different from tenure and functional background in important ways. Gender is associated with clear societal stereotypes (Fiske, 1998), which may contribute to the normative fit of subgroupings involving gender distinctions. This may be especially true in TMTs where women are clearly underrepresented, because such 'token' status may add to the visibility of and negative responses to female TMT members (Kanter, 1977). Tenure, in contrast, is associated less with stereotypic beliefs and moreover is an interval variable for which it may be more negotiable what constitutes similarity and difference (e.g. in the context of a TMT, does a one-year tenure difference render two people similar or different?). Functional background is categorical and thus lends itself better to clear distinctions than tenure, but it typically lacks the association with widely shared stereotypes of gender. Accordingly, faultlines involving gender may provide a stronger basis for subgroupings than tenure by functional background faultlines (cf. Bezrukova et al., 2009). The decomposition of faultlines into their constituent elements in the present study may thus help uncover meaningful differences in this respect that may be understood through the principle of normative fit – we would expect faultlines involving gender to have a stronger influence.

Central to our analysis is the moderating influence of shared objectives in the faultline–performance relationship, and we note that moderation hypotheses typically qualify hypotheses regarding direct relationships (i.e. moderation implies that a direct relationship may not hold for all levels of the moderator). Even so, including a formal test of the direct relationship hypothesis is useful, because it speaks to the value of our approach of decomposing faultlines in and of itself. In sum, then, we tested the following hypotheses:

Hypothesis 1: Two-dimensional and three-dimensional faultlines formed by TMT diversity in gender, tenure, and functional background are negatively related to organizational performance.

Hypothesis 2: The negative relationship between diversity faultlines and organizational performance is weaker with higher shared objectives.

Method

Sample

Data were collected from UK manufacturing companies identified from sector databases and by Chambers of Commerce and Trade Associations. Companies from four sectors were approached: engineering, plastics and rubber, electronics and electrical engineering, food and drink. A few companies from other sectors were included in a miscellaneous category. A representative sample of 111 companies from this population was composed for a different research project not involving the current TMT data. We contacted the CEO of each to solicit cooperation for the current study and to identify the members of the TMTs. In 42 of these organizations, this was agreed and we distributed questionnaires to team members. A total of 248 of these 392 questionnaires were returned – a response rate of 63.3 percent. At least three questionnaires were returned for each team for a response rate of at least 50 percent, so there was no need to exclude teams from the study. We treated the returned data as if random, assuming that aggregated data from team members provided unbiased estimates of true team scores.[2] The 42 organizations were broadly representative of both the larger sample and the research population of small and medium manufacturing organizations in terms of overall performance. Respondents had a mean team tenure of 23.1 months (SD = 23.4 months). Functional background had response options of management (20%), finance (17%), engineering (38%), production (11%), marketing/sales (13%), or human resource management (3%). The sample included 96 percent men and 4 percent women.[3]

Measures

Faultlines We propose improvements over previous faultline measurement that may be seen as a contribution of the current study in and of itself. First, as outlined in the introduction, we decomposed faultlines into two- and three-dimensional faultlines. Second, our measure maintains the continuous nature of an interval variable like tenure. Various methods for measuring faultlines have been proposed and used, notably Thatcher et al.'s (2003) index (*Fau*), and Shaw's (2004) index based on a Chi-squared statistic. All of these measures have in common that they are based on categorical measurement of variables. When variables are continuous (e.g. tenure), this requires that artificial categorization take place, resulting in a loss of measurement validity (i.e. faultlines based on artificial dichotomies may both be underestimated and overestimated as compared with what would be justified on the basis of the continuous variable). We therefore propose an index that allows incorporation of continuous variables, but is otherwise consistent with the principles behind Shaw's (2004) index, which differs from Thatcher et al.'s (2003) in that it captures within-subgroup similarity as well as between-subgroup differences consistent with the notion that within-group similarities and between-group differences drive categorization salience based on faultlines (van Knippenberg et al., 2004a).

In the case of two attributes, this is equivalent to the extent to which one attribute is explained by the other. This is captured by effect size relating amount of variance in one attribute explained by the other; that is, R or R^2 in regression terms. This also has the

advantage of being measured on a meaningful scale: 0 represents no faultline; 1 a complete faultline.[4] To illustrate, take the case of a potential gender by tenure faultline. If all variation in tenure is captured by gender (e.g. the three male members of a team have three years of tenure, the female member of the team two years), R is 1 to capture a complete faultline. When there is variation in tenure within gender, however (e.g. two male members have three years of tenure, the third four years), the faultline is weaker (and R lower) as not all variation in tenure is captured by gender. In case gender group boundaries also overlap in tenure (e.g. one of the male members has one year of tenure, the other two three), the faultline is even weaker and R even lower. Thus, consistent with the comparative fit definition of faultlines, R is higher with higher within-group similarity and between-group difference.

In the case of faultlines formed by more than two dimensions, the issue is less straightforward, as (in the case of three dimensions) $R_{y.xz}$ is not usually equal to $R_{x.yz}$ or $R_{z.xy}$ (where $R_{y.xz}$ represents the multiple correlation when y is regressed on x and z). There is no obvious choice between them, so the best option is to use a combination of all three. Note that a complete three-dimensional faultline would be present if and only if $R_{y.xz} = R_{x.yz} = R_{z.xy} = 1$, as this would mean any one variable is uniquely defined by the other two. Conversely, if any of the three were zero, then this would mean there is no interplay between the three variables above and beyond that described by the two-dimensional terms, and thus the three-dimensional faultline should also be zero. Therefore, we measure the three-dimensional faultline by the product $R_{y.xz}.R_{x.yz}.R_{z.xy}$, and note that it should only be included in regression analysis when each of the two-dimensional terms is also included. More generically, for a set of k attributes $x_1, x_2, \ldots, x_k$, the k-dimensional faultline term is given by the formula:

$$F_k = \prod_{i=1}^{k} R_{x_i.\{\text{All } x \neq x_i\}}$$

Note that the two-dimensional faultlines and the three-dimensional faultline (or more generally, a k-dimensional faultline) thus are not qualitatively different in nature: all capture the extent to which team member characteristics on different diversity attributes converge. They only differ in the number of diversity attributes on which they are based.

Gender is dichotomous, but functional background has six categories. It is not possible to calculate $R_{y.xz}$ in the same way when functional background is a dependent variable. Instead, we perform a multinomial logistic regression, taking the square root of a pseudo-R^2 to get an equivalent figure (using Nagelkerke's pseudo-R^2 which is scaled between 0 and 1).

Diversity Following Harrison and Klein (2007), to capture gender and functional background diversity (i.e. variety), we used Blau's (1977) index. Diversity for the interval variable of tenure was measured by the standard deviation (i.e. separation).

Shared objectives Shared objectives were measured with Anderson and West's (1998) scale. This includes 11 items on clarity, perceived value, sharedness, and attainability of team objectives. Example items include, 'How clear are you about what your team

objectives are?', and 'To what extent do you think other team members agree with these objectives?' (responses on five-point scales from 'Not at all' to 'Completely'). Internal consistency was good (α = .91). Agreement of team members' responses was demonstrated by an average $R_{wg(j)}$ value of 0.97. Interrater reliability was good with ICC(1) = .21.

Performance We used two performance indicators especially developed for the UK manufacturing industry (Nickell and van Reenen, 2001), organizations' productivity and profitability. Productivity was defined as log(value added per employee), standardized by industrial sector and retail price index. Value added refers to the value added by the firm to the raw materials and components available at the beginning of the production process. This was calculated by adding to pre-tax profits, labour costs (wages and salaries, bonuses, National Insurance contributions), and capital costs (depreciation of assets, interests payments on loans). Profitability was defined as log(profit per employee), standardized by industrial sector and retail price index. Data used were averages for the three-year period beginning with the financial year in which survey data were collected. Performance data were collected from publicly available financial records.[5]

Control variables

In common with other research with financial data as outcomes, we controlled for size of organization (measured by log(number of employees)) and sector (engineering, rubber/plastics, or other). We also controlled for prior performance (productivity or profitability as appropriate), measured as the average performance in the three financial years prior to data collection. Following Harrison and Klein (2007), we included the average team tenure and dummy variables representing the proportions of each functional background as controls, as well as team size.[6]

Results

Table 1 displays descriptive statistics. Faultline measures are inevitably correlated with their constituent parts (e.g. diversity controls) – the high correlations observed between these measures are there 'by design' and come as no surprise. Even so, they raise the question of whether multicollinearity might be a problem. We therefore consulted collinearity statistics for the regression analyses, and these suggested that multicollinearity was not a significant problem in these analyses. Table 2 shows the results of regression analyses of the performance variables on the two-dimensional faultlines and on the three-dimensional faultline controlling for the two-dimensional faultlines (i.e. the three-dimensional faultline is operationalized as the product of the two-dimensional faultlines and the regression can only yield an estimate of the three-dimensional faultline when the influence of the two-dimensional faultlines is partialed out; conversely, a test of the two-dimensional faultlines requires that the three-dimensional term is kept out of the equation). Changes in adjusted R^2 are shown to demonstrate that the change in R^2 cannot be attributed to shrinkage (note that such adjusted change values can be larger than unadjusted values). Hypothesis 1 was only supported for the gender*functional background faultline as predictor of productivity (ΔR^2 = 12.4%, $p < .01$), testifying to the importance of decomposing faultlines.[7]

Table 1 Means, standard deviations and correlations between all study variables

	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Team size	9.33	14.38														
2. Productivity	2.58	0.34	0.04													
3. Profitability	2.38	4.91	–0.52	0.56												
4. Prior productivity	2.70	0.41	0.03	0.56	0.16											
5. Prior profitability	2.10	5.99	0.04	0.15	0.05	0.70										
6. Organization size[a]	5.22	0.65	0.01	0.21	0.04	0.17	0.07									
7. Sector: engineering[b]	0.48	0.51	–0.15	–0.22	0.17	0.01	–0.05	–0.12								
8. Sector: rubber/plastics[b]	0.24	0.43	0.27	–0.08	–0.14	–0.30	–0.22	–0.17	–0.53							
9. Sector: other[b]	0.29	0.46	–0.09	0.32	–0.06	0.27	0.26	0.30	–0.60	–0.35						
10. Mean tenure (months)	23.10	23.41	–0.18	–0.21	0.10	–0.12	–0.11	–0.29	0.50	–0.37	–0.20					
11. % Management	16%	16%	0.19	0.03	0.03	–0.16	–0.11	0.01	–0.03	0.05	–0.01	–0.10				
12. % Finance	19%	13%	–0.27	–0.01	0.06	–0.05	–0.09	–0.01	–0.24	–0.03	0.29	0.15	–0.26			
13. % Engineering	35%	25%	0.02	–0.06	–0.12	0.28	0.12	–0.13	0.45	–0.09	–0.41	0.18	–0.35	–0.32		
14. % Production	13%	15%	0.06	–0.05	0.01	–0.14	0.06	–0.07	–0.29	0.06	0.27	–0.07	–0.20	0.12	–0.52	
15. % Marketing/sales	13%	14%	–0.01	0.11	0.17	0.00	0.09	0.23	–0.17	0.09	0.10	–0.22	0.07	–0.15	–0.43	–0.12
16. % HRM	3%	8%	–0.07	0.03	–0.09	–0.23	–0.31	0.11	–0.09	–0.03	0.13	–0.11	–0.22	–0.13	–0.16	0.13
17. Gender diversity	0.07	0.13	0.16	0.05	–0.26	–0.11	–0.05	0.04	–0.31	–0.02	0.36	–0.18	0.04	–0.35	0.02	–0.05
18. Tenure diversity	0.33	0.21	0.14	0.43	0.10	0.48	0.39	0.33	–0.25	–0.09	0.36	–0.01	0.20	–0.11	–0.08	0.08
19. Functional background diversity	0.63	0.15	0.12	0.00	0.03	–0.24	–0.16	0.21	–0.20	0.20	0.03	–0.20	0.34	0.08	–0.61	0.10
20. Shared objectives	3.91	0.38	–0.05	–0.13	0.13	–0.44	–0.25	–0.09	0.03	0.07	–0.10	0.02	–0.04	–0.03	–0.30	0.15
21. Gender*tenure faultline	0.08	0.16	0.30	0.07	–0.27	0.01	0.00	–0.12	–0.22	0.07	0.17	–0.18	0.19	–0.45	0.09	–0.13
22. Gender*functional background faultline	0.16	0.36	0.23	–0.04	–0.30	0.15	0.26	0.18	–0.30	–0.02	0.35	–0.31	–0.07	–0.21	–0.02	–0.02
23. Tenure*functional background faultline	0.75	0.27	–0.19	0.02	0.17	–0.22	–0.17	0.06	–0.12	0.01	0.12	0.06	0.04	0.54	–0.47	0.03
24. Gender*tenure *functional background faultline	0.11	0.24	0.41	0.04	–0.37	0.05	0.10	0.12	–0.27	–0.02	0.33	–0.32	0.07	–0.14	–0.15	0.10

(Continued)

Table 1 (Continued)

	15.	16.	17.	18.	19.	20.	21.	22.	23.
16. % HRM	–0.06								
17. Gender diversity	0.04	0.44							
18. Tenure diversity	0.12	–0.34	0.05						
19. Functional background diversity	0.42	0.21	–0.28	–0.03					
20. Shared objectives	0.37	0.16	0.04	–0.30	0.24				
21. Gender*tenure faultline	0.04	0.29	0.82	0.05	–0.30	–0.09			
22. Gender*functional background faultline	0.12	0.37	0.66	0.00	0.01	0.06	0.48		
23. Tenure*functional background faultline	0.19	0.09	-0.31	–0.19	0.43	0.09	–0.29	–0.26	
24. Gender*tenure *functional background faultline	–0.04	0.46	0.65	–0.07	0.03	0.02	0.53	0.85	–0.08

Notes: $N = 42$ organizations. Correlations of magnitude 0.31 or greater are significant with $p < .05$, correlations of magnitude 0.39 or greater are significant with $p < .01$.

[a] Measured as log(number of employees).

[b] Dummy variable.

Table 2 Regression analyses of productivity and profitability on faultlines

Dependent variable	Productivity		Profitability	
Model	Two–dimensional faultlines	Three–dimensional faultline	Two–dimensional faultlines	Three–dimensional faultline
Prior productivity	0.82**	0.79**		
Prior profitability			0.08	0.08
Organization size	0.00	0.01	–0.02	–0.02
Sector: engineering	–0.08	–0.15	0.28	0.27
Sector: rubber/ plastics	0.08	0.08	0.15	0.16
Team size	0.10	–0.02	–0.50*	–0.52
Mean tenure	–0.07	–0.02	–0.08	–0.07
% Management	–0.42	–0.32	–0.14	–0.12
% Finance	–0.42	–0.31	–0.26	–0.25
% Engineering	–0.92	–0.58	–0.52	–0.47
% Production	–0.57	–0.43	–0.19	–0.17
% Marketing/sales	–0.41	–0.20	–0.05	–0.02
Tenure diversity	0.04	0.12	–0.17	–0.16
Functional background diversity	0.08	0.08	0.23	0.23
Gender diversity	0.65	0.61	–0.07	–0.08
Tenure*functional background faultline	0.08	–0.01	0.09	0.08
Gender* functional background faultline	–0.58*	–0.90*	–0.10	–0.14
Gender*tenure faultline	–0.32	–0.32	–0.08	–0.08
Gender*tenure* functional background		0.42		0.06
ΔR^2 due to faultline(s)[a]	0.124	0.016	0.009	0.000
Δ Adjusted R^2 due to faultline(s)[a]	0.108	–0.003	–0.095	0.042

Notes: * $p < .05$; ** $p < .01$; Figures in main section of table are standardized regression (beta) weights.
[a]For the three–dimensional models, changes in R^2 refer to the three–dimensional term only.

Table 3 Regression analyses of productivity on faultlines moderated by shared objectives

Model	3a	3b	3c	3d
Prior productivity	0.96**	0.99**	1.12**	1.12**
Organization size	0.00	–0.01	0.04	0.01
Sector: engineering	0.03	–0.28	–0.13	–0.06
Sector: rubber/plastics	0.24	0.04	0.21	0.24
Team size	0.06	–0.22	0.06	–0.14
Mean tenure	0.19	–0.25	0.02	0.05
% Management	0.30	–0.44	–0.09	0.07
% Finance	0.10	–0.44	–0.16	0.13
% Engineering	0.06	–0.36	–0.09	0.14
% Production	–0.05	–0.02	0.08	–0.03
% Marketing/sales	–0.13	0.01	–0.13	–0.01
Tenure diversity	0.10	0.11	0.11	0.08
Functional background diversity	1.05*	0.59	0.90*	1.06
Gender diversity	0.40	0.19	0.07	0.22
Shared objectives	0.45*	0.49*	0.55	0.54*
Tenure*functional background faultline	–0.07	0.05	–0.05	–0.08
Gender*functional background faultline	–1.25**	–0.97*	–1.36**	–1.40*
Gender*tenure faultline	–0.20	–0.18	–0.17	–0.21
Gender*tenure*functional background	0.55	0.31	0.71	0.69
T*F faultline/objectives interaction	–0.40			0.41
G*F faultline/objectives interaction		0.32		–0.14
G*T faultline/objectives interaction			0.49*	0.16
Three–way faultline/ objectives interaction				–0.19
ΔR^2 due to interaction term[a]	0.058	0.056	0.075	0.001
Δ adjusted R^2 due to interaction term[a]	0.081	0.077	0.113	–0.030

Notes: * $p < .05$; ** $p < .01$. Figures in main section of table are standardized regression (beta) weights (note that beta weights represent the predicted change in the criterion for one unit change in the predictor, and unlike correlations can be larger than 1 or smaller than –1).

[a] For model 3d, the interaction term refers to the interaction between shared objectives and the three–dimensional faultline only

Tables 3 and 4 show the results of regression analyses testing the moderating effect of shared objectives on the faultline–performance relationships. There was a moderating effect of shared objectives on the gender*tenure faultline relationship with productivity ($\Delta R^2 = 7.5\%$, $p < .05$), shown in Figure 1. Simple slopes analysis shows that when shared objectives was low (1 SD below the mean), there is a negative relationship between faultline and performance, $b = –.27$, $t = –2.13$, $p < .05$. When shared objectives was high (1 SD above the mean), there was no relationship between the faultline and performance, $b = .15$, $t = 1.09$, $p = .29$. For profitability, there was a moderating influence on the relationship for the gender*functional background faultline ($\Delta R^2 = 12.3\%$, $p < .05$), shown in Figure 2. When shared objectives was low, there was a negative relationship between faultline and performance, $b = –7.18$, $t = –2.06$, $p = .05$. When shared objectives was high, there was no relationship, $b = 1.84$, $t = .72$, $p = .48$. Results thus provide support for Hypothesis 2.

Table 4 Regression analyses of profitability on faultlines moderated by shared objectives

Model	4a	4b	4c	4d
Prior profitability	0.28	0.57	0.31	0.61
Organization size	–0.05	–0.06	–0.01	–0.08
Sector: engineering	0.51	0.04	0.25	0.23
Sector: rubber/plastics	0.35	0.11	0.22	0.22
Team size	–0.65*	–0.43	–0.62*	–0.50
Mean tenure	–0.11	–0.03	0.01	–0.07
% Management	0.20	–0.29	0.00	–0.12
% Finance	0.28	–0.37	–0.08	–0.07
% Engineering	0.39	–0.81	–0.33	–0.29
% Production	0.33	–0.62	–0.19	–0.26
% Marketing/sales	0.26	–0.50	–0.04	–0.26
Tenure diversity	0.24	0.21	0.31	0.18
Functional background diversity	0.48	–0.06	0.06	0.30
Gender diversity	0.18	–0.05	–0.27	0.20
Shared objectives	0.42	0.63*	0.43	0.68*
Tenure*functional background faultline	–0.08	0.05	–0.04	–0.03
Gender*functional background faultline	–0.69	–0.54	–0.69	–0.74
Gender*tenure faultline	0.03	0.09	0.09	0.06
Gender*tenure*functional background	0.29	–0.03	0.43	0.04
T*F faultline/objectives interaction	–0.53			–0.10
G*F faultline/objectives interaction		0.62*		–0.33
G*T faultline/objectives interaction			0.49	0.62
3–way faultline/objectives interaction				–0.07
ΔR^2 due to interaction term[a]	0.091	0.123*	0.069	0.000
Δ adjusted R^2 due to interaction term[a]	0.127	0.191	0.085	–0.049

* $p < .05$; ** $p < .01$; Figures in main section of table are standardized regression (beta) weights.
[a] For model 4d, the interaction term refers to the interaction between shared objectives and the three–dimensional faultline only.

Discussion

The current study extends faultline theory and research by demonstrating that the categorization salience analysis that lies at the root of faultline theory can be extended to identify moderation of the influence of diversity faultlines. Moreover, our decomposition of faultlines into their constituent parts suggests that not all faultlines are created equal (cf. Bezrukova et al., 2009) and hints at some potentially important considerations for further development of faultline theory. In the following sections we consider the theoretical implications of these findings as well as the practical implications of especially the moderating role of shared objectives.

Theoretical implications

Hypothesis 1 that faultlines are negatively related to performance in and of itself is not a novel insight – Hypothesis 2, which identified shared objectives as a moderator of the relationship between faultlines and performances, is clearly the main hypothesis in this study. Indeed, one may note that the moderation proposed in Hypothesis 2 qualifies

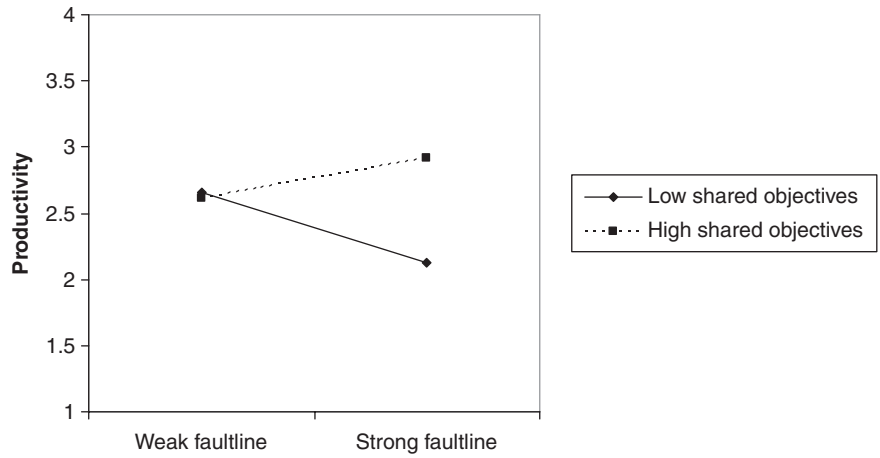

Figure 1 Moderating effect of shared objectives on the gender*tenure faultline–productivity relationship

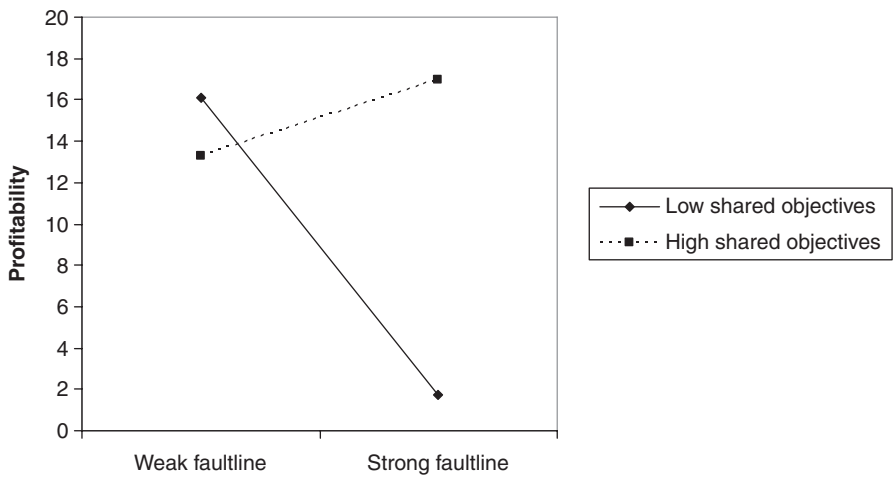

Figure 2 Moderating effect of shared objectives on the gender*functional background faultline–profitability relationship

Hypothesis 1, in the sense that it implies that negative relationships between faultlines and performance would not be obtained for all levels of shared objectives. Accordingly, the main theoretical implications we derive from the test of our hypotheses revolve around the evidence in support of Hypothesis 2. To contextualize this discussion, however, it is useful to first consider the evidence in support of Hypothesis 1, especially because this also speaks to the value of our approach to decomposing faultlines.

An important caveat in considering this evidence is that given the conservative nature of hypothesis testing, especially with a small sample size like the current one, we should be careful not to base too far-reaching conclusions on null findings. Our discussion of the value of our approach to decompose faultlines is framed around the observation that only a limited number of relationships was significant, which may suggest that these were the stronger relationships and not necessarily that the other relationships could not emerge in more powerful tests. That being said, our decomposition of faultlines into two and three-dimensional faultlines and the separate dimensions of diversity concerned yielded results that contain building blocks for valuable extensions of diversity and faultline theory. While all three dimensions of diversity under consideration were involved in faultline influences, faultlines that did not include gender were unrelated to performance. Gender by functional background faultlines predicted productivity, and profitability contingent on shared objectives, and gender by tenure faultlines predicted productivity contingent on shared objectives (but not profitability).

Even though this particular pattern of results was not predicted in detail, stronger relationships for faultlines involving gender were anticipated and the rationale for our approach to decomposing faultlines holds at least part of the explanation for these findings. Gender, more than tenure and functional background, is associated with widely shared stereotypic beliefs (Fiske, 1998), and subgroupings involving gender may thus have greater normative fit (i.e. be more subjectively meaningful to team members; Turner et al., 1987) than tenure by functional background faultlines. The nature of these variables may have further contributed to the apparently stronger influence of faultlines involving gender: gender is a dichotomy, functional background is a multinomial categorical variable, and tenure is an interval variable. Categorizations are used to reduce complexity and are more likely to be salient if they result in simple dichotomies – a finding that also holds for faultlines (Polzer et al., 2006) and that can be seen as reflecting aspects of comparative fit. In combination, this may make gender-based faultlines more likely to result in salient subgroupings. The fact that functional background was more strongly implicated in these faultlines than tenure is also consistent with the notion that a categorical variable might more easily invite subgroupings than an interval variable, as well as with the more common-sense assumption that stereotypes about functional groups are more likely than stereotypes about tenure (i.e. a functional background subgrouping may have greater normative fit than a tenure subgrouping). Diversity research has typically not conceptualized differences between dimensions of diversity in terms of the continuous versus categorical nature of the variables involved (cf. Harrison and Klein, 2007), but the present findings suggest that this may be a direction worth pursuing in further extending faultline theory as well as diversity theory more generally. Normative fit has been identified as an influence on the relationship between faultlines and performance (van Knippenberg et al., 2004a) but has hardly been studied (cf. Pearsall et al., 2008), and the present findings corroborate the call for more attention to the role of normative fit in diversity and faultline effects.

With the small sample size in mind, it is also important to note that the three-dimensional faultline was not related to performance, suggesting at least that the influence of this faultline was relatively weak. The importance of this observation lies in the fact that in earlier studies this would have been the only faultline relationship tested. This observation too corroborates the value of our proposed approach to decomposing faultlines.

Again with the caveat of small sample size in mind, we may conclude that there is support for the prediction that TMT faultlines are negatively related to organizational performance, but primarily so for faultlines that presumably also have substantial normative fit. Arguably, organizational performance is the ultimate bottom line to assess TMT performance. We are therefore tempted to conclude that the current support for Hypothesis 1, albeit qualified by the nature of the variables involved, provides key evidence for the value of faultline theory to our understanding of TMT performance. Even so, from the perspective of theory development one might argue that the test of Hypothesis 1 is an incremental step forward more than a breakthrough: it concerns the relationship with a dependent variable that so far had not been tested, but directly follows from faultline theory. We would not object to this reading and propose that the value of the test of Hypothesis 1 lies first and foremost in the bottom line evidence it provides.

Our approach to decomposing faultlines was also valuable in establishing that when controlling for faultlines, and thus presumably for diversity-based subgroupings, diversity had no negative relationship with performance. It had no positive relationship with performance either, underscoring the implication of the CEM that preventing negative diversity effects is a necessary but insufficient condition to harvest the benefits in diversity. Other contingencies would need to be considered to establish positive relationships between (TMT) diversity in gender, tenure, and functional background and (organizational) performance (see Canella et al., 2008; van Knippenberg et al., 2004a). Another way of looking at these null findings for diversity is in combination with the findings for faultlines. Faultline findings suggest that comparative fit alone is not enough to elicit faultline effects. Normative fit is also required. Complementing this conclusion, the diversity findings suggest that normative fit alone is not enough either (i.e. there were no relationships for gender diversity) – it is the combination of comparative fit and normative fit that renders differences between group members salient (see Turner et al., 1987; van Knippenberg et al., 2004a).

From the perspective of theory development, the evidence for Hypothesis 2 is of greatest importance. Here too, the conclusion should be that the nature of the attributes involved – the presumably greater normative fit of gender-based categorizations – qualifies the conclusions regarding Hypothesis 2: shared objectives is an attenuating influence on the impact of faultlines with substantial normative fit. The notion of faultlines can be traced back to the categorization salience principle of comparative fit (Turner et al., 1987; van Knippenberg et al., 2004a). The present study shows that this perspective can also be adopted to extend faultline theory with the principle of normative fit, identifying shared objectives as an attenuating influence. In that sense, the present findings can be seen both as an extension of faultline theory and as further evidence for the salience of social categorization analysis that lies at the heart of faultline theory. The support for Hypothesis 2 also suggests that other factors that may shift attention from the subgroupings signaled by a faultline to the shared team membership may similarly attenuate the negative influence of faultlines.

Faultlines may for example be less problematic when a team is faced with a 'common enemy' that confronts the team with a shared problem, for instance in case of strong inter-organizational competition (cf. van Knippenberg, 2003). Extending this logic further, we may also predict that factors that divert attention away from subgroupings by focusing team members on individuating characteristics rather than on the shared identity (Gaertner et al., 1993) may also attenuate the negative impact of faultlines. Swann,

Polzer, and colleagues (Polzer et al., 2002; Swann et al., 2004) suggest that such individuating influences may be conducive to diverse teams' performance. It seems a reasonable prediction that a similar influence may be obtained in teams with diversity faultlines – indeed, probably even more strongly so. Exploring these issues in future research would serve the dual goal of further developing faultline theory and identifying ways to manage faultlines in practice.

In sum, the overarching theme in these conclusions and implications is that it is the combination of comparative fit and normative fit that renders differences between team members a salient influence on team performance. While this is a conclusion that is consistent with the CEM (van Knippenberg et al., 2004a) and with its roots in self-categorization theory (Turner et al., 1987), diversity research to date pays only a quite modest amount of attention to the role of social categorization salience, and to the extent that it does so almost exclusively focuses on the role of comparative fit (i.e. faultlines) and not on normative fit (cf. Pearsall et al., 2008). Moreover, the present analysis underscores the conclusion that comparative fit and normative fit should not be studied in isolation, but rather as interactive influences on social categorization salience, and thus on team process and performance. In that sense, the current conclusions also are a 'call to arms' to diversity researchers to pay more attention to the interplay of comparative fit and normative fit.

In this respect, it is important to emphasize that normative fit should not only be understood in terms of a comparison between diversity attributes (e.g. gender vs tenure and functional background in the current study), but also as a factor that for the same attribute may vary across situations (cf. Pearsall et al., 2008; van Knippenberg et al., 2004a). A gender categorization will, for instance, have greater normative fit in task settings that are more strongly associated with gender stereotypes (e.g. the military vs academia). Individual differences may also play a role here, as people differ in the extent to which they hold sexist beliefs (Glick and Fiske, 1996), and more sexist beliefs would render gender categorizations more subjectively meaningful to team members. In a related vein, people differ in the extent to which they believe that gender diversity itself is important (van Knippenberg et al., 2007) and this too directly speaks to the normative fit of a gender categorization. Especially for a diversity attribute like gender, which has a relatively high 'base rate' normative fit (see Fiske, 1998) it would thus seem important to explore contextual and individual variations in normative fit.

Implications for practice

From a team composition perspective, one implication of faultline theory would be to prevent faultlines in team composition, for instance by only selecting a woman for the team if she has a similar functional background to those of the rest of the team. This is an undesirable and unrealistic strategy for at least two reasons. First, it would further increase barriers to the entry of members of underrepresented groups (e.g. women, ethnic minorities). Second, it would reduce the degrees of freedom in selection for these positions where highly qualified people are in high demand. From an applied perspective, the more viable and more obvious route would therefore be to try to manage faultlines when they are present rather than trying to prevent faultlines in team composition. From this perspective, the finding that shared objectives attenuate the effects of diversity faultlines provides important pointers.

Team leadership may fulfill an important role by creating a focus on and commitment to shared objectives. Indeed, formulating and communicating a vision or mission for the organization is seen as a key aspect of effective leadership (Shamir et al., 1993; van Knippenberg et al., 2004b). Hinting at the viability of this perspective, research recently established that transformational leadership, a form of leadership associated with clarity and sharedness of goals (Schippers et al., 2008), is instrumental in reaping the benefits in diversity and preventing its negative effects (Kearney and Gebert, 2009; Shin and Zhou, 2007). This relationship may hold even stronger where faultlines are concerned. Shared objectives may also be achieved through a process of team reflexivity – collectively reflecting on and learning from team process and performance to reach a more shared and adaptive understanding of team process and team objectives (van Ginkel and van Knippenberg, 2009; van Ginkel et al., 2009; West, 1996). Leadership may be instrumental in engendering such a process of reflexivity (Schippers et al., 2008).

Limitations and future directions

A limitation of the current sample is its small size. While this is related to the difficulty of obtaining TMT survey data and not uncommon in TMT research (Barkema and Shvyrkov, 2007; Cho and Hambrick, 2006; West and Anderson, 1996), it does mean that there was only limited statistical power for the test of our hypotheses. While this is no problem for the validity of conclusions based on significant relationships – statistical tests take sample size into account – we should be careful not to discard unsupported relationships too easily (i.e. weaker relationships may not be uncovered owing to low power). While the fact that only faultlines involving gender were related to performance is consistent with theory about categorization salience, we should thus not jump to the conclusion that faultlines formed by tenure and functional background would not affect performance – indeed, findings by Bezrukova et al. (2009) on lower-level teams suggest they may. A related issue is that for methodological reasons, we based our performance measure on a three-year average. An implication of this approach is that if changes in TMT composition within this three-year period affected organizational performance, this would add error variance. While this does not threaten the validity of the conclusions based on significant findings, this consideration too cautions us not to base too far-reaching conclusions on null findings, as these might also be owing to underestimation of the relationships.

Another issue is the small number of women in the sample. While this reflects the reality of TMTs (Sealy et al., 2008; Welbourne et al., 2007), it does mean that we should realize that this forms a boundary condition to our conclusions (Harrison and Klein, 2007) in that our findings only pertain to the lower end of the possible range of gender diversity and faultlines based on gender diversity. As the proportion of female TMT members increases, the dynamics associated with gender diversity and faultlines in TMTs may change. Interestingly and importantly, however, it is not self-evident in what direction. On the one hand, there is an argument to be made that solo minorities are less 'threatening' to the majority and more likely to be approached on an interpersonal basis (i.e. as opposed to categorization-based) than larger representations (see Phillips et al., 2004; van Knippenberg et al., 2004a). This would suggest that gender-based faultlines will exert a stronger influence as the representation of women in TMTs grows. On the other hand, there is a case to be made that team gender diversity will stand out less as the

representation of women grows and female TMT members move away from token status (Kanter, 1977; cf. Joshi and Roh, 2009), and thus will invite less negative responses as gender diversity becomes more the norm. The strength of a faultline is in principle independent from the size of the groups involved, and this would seem to be an important issue for future research to address.

While our analysis has clear implications for the mediating processes involved, we did not actually assess these processes. It would be valuable if future research would assess the salience of subgroupings and the shared team membership (see Earley and Mosakowski, 2000; Randel, 2002) to further substantiate our analysis. Also, as outlined in the Introduction, the CEM identifies team information elaboration as the key process at stake in the performance effects of faultlines, and future research incorporating measures of information elaboration (see Homan et al., 2007b; Kearney et al., 2009; van Ginkel and van Knippenberg, 2008) would therefore be valuable.

Recent research by Gibson and Vermeulen (2003) showed that faultlines may have a curvilinear relationship with team learning. We may thus raise the question of whether similar curvilinear relationships obtain for organizational performance. In additional analyses, we therefore added curvilinear relationships to the regression equations, and tested their relationships with organizational productivity and profitability. We did not find evidence of curvilinear relationships. While this could mean that the curvilinear relationships obtained by Gibson and Vermeulen do not extend to (organizational) performance, we should also note that statistical power may be an issue here, and it would seem wise to keep curvilinear relationships on the agenda for future research.

Conclusion

The present study extends faultline theory and research by demonstrating how the categorization salience analysis may be used to identify moderators of the faultline–performance relationship as well as by introducing a measurement approach that is more informative about the locus of faultline influences and that allowed us to maintain the continuous nature of interval variables. In doing so, it also pointed to the potential value-added of developing faultline theory in terms of nature of the variables involved and established the relevance of a faultline analysis to bottom line organizational performance. It thus suggests that further development of faultline theory, in particular by incorporating notions of normative fit, is a valuable avenue to advance our understanding of team diversity and performance.

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Notes

1 We did measure age, however, and additional analysis substituting tenure with age in our analysis yielded similar patterns of results. While ethnic diversity would of course be of interest, ethnic minorities are virtually absent in our research population (senior management in the UK; Sangler-Grant and Schneider, 2004). Indeed, there was only one member of an ethnic minority in our entire sample.

2 Ideally we would base our faultline and diversity measures on 100 percent response per team and the less than 100 percent response raises the question of potential response biases. Given the current focus such biases would primarily be a concern for the faultline measures, and in an additional analysis we correlated response percentage per team with each of the faultline measures. None of these correlations was significant, suggesting that non-response was unlikely to have a large influence on the accuracy of our faultline measures. We also tested interactions between team response percentage and faultlines as another means to identify potential non-response biases, but none of these interactions even approached significance, further suggesting that non-response did not have a substantive influence on our main findings.

3 No public data were available to determine how representative of the research population (i.e. TMTs of small and medium-sized manufacturing companies in the UK) our sample is in terms of the diversity variables. Statistics provided by Sealy et al. (2008; cf. Welbourne et al., 2007) suggest, though, that while clearly our sample is heavily male-dominated, this is broadly representative of the research population. For tenure and functional background no information was available to make such comparisons, which is a limitation of the current data in terms of our ability to establish the representativeness of our sample.

4 A complete faultline would be where the team is split into non-overlapping subgroups, each with members identical to each other on the attributes involved in the faultline, but with separation between the subgroups on all attributed involved. A zero-faultline is a case where there is no relationship between the attributes across the team. Note that for a dichotomous variable like gender, faultlines inevitably can only involve two subgroups, while for faultlines of dimensions with multiple categories (e.g. functional background) or of interval nature (e.g. tenure) it is possible to have faultlines distinguishing more than two subgroups (e.g. different functional groups with a distinct tenure range). Also note that our measure can easily be extended to capture faultlines formed by more than three dimensions.

5 The productivity and profitability measures were developed as measures of performance for organizations in the UK manufacturing sector specifically. They have been devised so that they account for expected production differences between manufacturers of different products (using aggregated national differences according to the Standard Industrial Classification codes of the different companies), whilst capturing the same type of information as measures such as return on investment. For instance, the measure of profitability is not a raw figure, but an adjusted ratio of sales to costs. We use a three-year performance average for two reasons. First, the organizations do not have consistent accounting dates. Therefore differences between the dates used could lead to artificial differences between company sales figures owing to external economic factors applying to one set of figures more than another. Such effects are likely to be far less prominent when averaged over a three-year period, as the non-overlapping time is much smaller proportionally. Moreover, as the fieldwork took place over several months, it allows us to ensure there are not such large time differences from when the fieldwork took place to when the financial information was taken between organizations. Second, although some TMT interventions will of course lead to immediate changes in productivity and profitability, others will relate to longer-term strategic changes which will not necessarily realize improvements in financial performance in year one. Obviously we acknowledge that any changes in the TMT may lead to newer, short-term changes occurring later in the three-year period as well, and for that reason the measure is certainly not perfect. However, considering both of the above reasons, we believe the longer-term version to be less worrisome than a one-year version.

6 A similar control was not possible for gender, because female members, if present at all, were in the minority in all teams, rendering the proportion women essentially interchangeable with our gender diversity measure. Note that while this may render findings for gender diversity ambiguous (i.e. these could also be attributable to proportion of female members – 'mean' rather than diversity), this is unproblematic for our hypotheses tests, which focus on faultlines. By including gender diversity as a control for these tests, we in effect control for both gender diversity and proportion of female members.

7 To exclude the possibility that relationships where not owing to faultlines but rather to diversity × diversity interactions, we also ran analysis testing interactions between the different dimensions of diversity. None of these interactions was significant, supporting our interpretation in terms of faultlines.

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