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# Deep-level diversity in entrepreneurial teams and the mediating role of conflicts on team efficacy and satisfaction

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## Abstract

Team start-ups have substantial advantages over solo start-ups, but teams often do not live up to their potential due to conflicts creating unfavorable team dynamics. Based on an experiment with 665 individuals in 133 randomly composed teams participating in a new-venture simulation, we found team members' deep-level characteristics that trigger motivations to act, i.e., achievement motivation and leadership orientations, to be particularly important sources of task conflicts. We found that diversity in leadership orientation reduces conflicts because not all team members can lead at the same time. Unlike hypothesized, we found that diversity in achievement motivation also reduces conflicts, for which, ex-post, we explore potential reasons. Furthermore, we demonstrate that the mediating task and relationship conflicts differently affect team outcomes due to their different nature of task-relatedness: while task conflicts affect task-related team efficacy and may escalate into relationship conflicts, relationship conflicts directly affect team satisfaction, but not team efficacy. Further emphasizing the importance of a motivational basis of conflicts, we found that individuals' general self-efficacy, a more belief-related construct, affects team outcomes only through team efficacy, but not via conflicts.

**Keywords** Entrepreneurial teams · Deep-level diversity · Task conflicts · Relationship conflicts · Team efficacy · Team satisfaction · Experiment

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## Introduction

Compared to solo founders, founding teams, on average, grow their businesses substantially faster. Depending on the founding team's composition, however, there is considerable heterogeneity in the survival and success rates of their businesses, as the start-up genome report shows with over 3,000 start-ups (Marmer et al. 2012). Acknowledging that many new venture teams often fail to live up to their potential, practitioners and entrepreneurship researchers dedicate substantial attention to understand how team composition and related team processes contribute to new venture performance (e.g., Hmieleski et al. 2012; De Jong et al. 2013; De Mol et al. *in press*; Klotz et al. 2014; Mathieu et al. 2008, 2014; Santos and Cardon 2019; Zhou 2016). To advance the entrepreneurship research on new venture team dynamics, Klotz et al. (2014) call to move from the study of causes to the analysis of mediating team processes. Among these mediating processes, emerging conflicts are widely seen not only as decisive processes associated with team heterogeneity but also as one of the critical determinants of team success or failure (Amason et al. 1995; Montoya-Weiss et al. 2001; Song et al. 2000; Xie et al. 2003). Although conflicts can emerge in various ways and for various reasons, they are often rooted in the deep-level sphere of human personality (Amason and Sapienza 1997). In a team setting, this deep-level personality complexity increases the potential for inter- and intrapersonal conflicts, which, in turn, substantially influences team outcomes and resulting venture performance (De Dreu and Gelfand 2008; De Wit et al. 2012; Jehn et al. 1997; Klotz et al. 2014).

Although there is agreement on the relevance of conflicts for team outcomes, research on the antecedents and effects of team conflicts question whether individuals can differentiate between and react differently to task and relationship conflicts (de Wit et al. 2012). Furthermore, it remains unclear whether task conflicts may actually positively rather than negatively affect team outcomes (de Wit et al. 2012). According to de Wit and colleagues, the most decisive factors that determine either a positive or negative effect of task conflicts are the type of teams (managerial or non-managerial), the types of performance measures considered (proximal or distal), and a potential association of task conflicts with unambiguously harmful relationship conflicts. Task conflicts might be particularly productive for the teams that have undergone excessively homogenizing group think processes (Turner and Pratkanis 1997). For newly starting teams that face loose structures, with the speed of iterations, momentum, thrive, and trust being more important than optimal solutions (Kurzner 1997), task conflicts might be more negative for team performance.

To advance entrepreneurship research, we analyze the effects of task and relationship conflicts on outcomes and, particularly, on team satisfaction and team efficacy for newly formed teams exposed to entrepreneurial tasks. Our analysis particularly builds on the foundations of de Jong et al. (2013), Hmieleski et al. (2012), and Mathieu et al. (2008). We suggest that task and relationship conflicts affect team outcomes through different mechanisms (Jehn 1994), which is reflected by different effects on different types of outcomes (De Dreu and Weingart 2003; de Wit et al. 2012). These distinctions eventually lead us to emphasize two distinct paths along which task conflicts affect team outcomes; that is, task conflicts may affect the perceptions of a team's ability to perform well on the task, but they may independently escalate into task-unrelated relationship conflicts. Responding to calls for more research that covers the entire

founding team rather than only the CEO (Klotz et al. 2014), we apply a multiple-informant design that builds on team composition in individual-level entrepreneurial characteristics, which are measured individually for each team member (de Jong et al. 2013). As a consequence of focusing on entrepreneurial teams, we also focus on the personality characteristics that have been previously matched to entrepreneurship, namely, achievement motivation, leadership orientation, and general self-efficacy (Rauch and Frese 2007), which themselves might be powerful sources or mitigators of conflicts (Klotz et al. 2014). Following De Wit et al. (2012, p. 15) who suggest that research “would benefit from (quasi-) experimental investigations that examine the relationship between intragroup conflict and proximal group outcomes more directly” and Williams et al. (2019) who call for more experiment-based entrepreneurship research, we employ experiments and randomize the team composition to reliably identify the causal effects of team composition on conflicts and team outcomes.

This study contributes to entrepreneurship research in two ways. First and in support of de Jong’s et al. (2013) mediation perspective, we demonstrate, based on experiments, that teams’ deep-level composition concerning entrepreneurship-matched traits such as achievement motivation and leadership orientation influence the emergence of task conflicts. In contrast, general self-efficacy, which is linked to entrepreneurship but is less strongly and less directly related to the motivational basis, was not found to be related to the emergence of conflicts, but it only directly leverages team efficacy. Extending previous research, our study suggests that task conflicts are more likely to be driven by *interpersonal* motivation-related personality characteristics (e.g., achievement motivation and leadership orientation), while the *intrapersonal* motivational characteristic of self-efficacy is not mediated by conflicts but affects team satisfaction via team efficacy.

Second, we contribute to research by conceptually and empirically demonstrating that the distinction between task and relationship conflicts (Jehn 1994) relates to the distinction between team outcomes that are more strongly related to the task, such as team efficacy, and those that are related to psychosocial outcomes, such as team satisfaction (Pinto et al. 1993). Task conflicts indirectly affect team satisfaction through both their effect on task-related team efficacy and an escalation into relationship conflicts, which do not affect team efficacy, but only team satisfaction. These findings suggest that individuals separate task conflicts from relationship conflicts, as previously questioned by de Wit et al. (2012), and they also support research that suggests that the effects of conflicts on team outcomes differ across outcome categories (de Wit et al. 2012).

## Theoretical framework and hypotheses

For the last two decades, researchers—and especially the business world—have placed much hope in the explanatory power of the different forms of team diversity, their effects on team outcomes, and ultimately their effects on venture performance (Klotz et al. 2014; Shu and Simmons 2018; Hmieleski and Sheppard 2019; Hendricks et al. 2019). In the early days of team research, so-called surface-level (and mainly publicly available) diversity factors such as age, gender, and ethnicity were under close scrutiny, whereas deep-level factors, including differences in attitudes, personality, and values,

have only gained more attention as the research field of deep-level diversity developed further (e.g., Barrick et al. 1998; Harrison et al. 2002; Mohammed and Angell 2004; Bell 2007; Palmer et al. 2015; Knipfer et al. 2018; Hmieleski and Sheppard 2019). Empirical research even suggests that surface-level differences decrease in importance, while deep-level characteristics increase in importance as groups continue to interact over time (e.g., Bell 2007; Harrison et al. 1998, 2002; Hollenbeck et al. 2004; Kollmann et al. 2019; Newman et al. 2019; Pelled et al. 1999). However, studies on the direct effect of deep-level diversity on performance still report mixed results (Bell 2007; Boone et al. *in press*; de Mol et al. *in press*; Santos and Cardon 2019).

From a theoretical perspective, the input-process-outcome (IPO) model, as suggested by McGrath (1964), is a useful reference for understanding how new venture teams leverage inputs (including individual team members' characteristics) through processes to achieve collective goals (Marks et al. 2001; Mohammed and Angell 2003; Mathieu et al. 2014). Inputs can be seen as antecedents that enable and restrict members' interactions directed toward task accomplishment, and processes describe how inputs are transformed into outcomes (Mathieu et al. 2008). The original IPO model has been developed further by Ilgen et al. (2005) into the input-mediator-outcome (IMO) model, which — in addition to processes as links between inputs and outputs — also includes so-called “emergent states”. Emergent states are “constructs that characterize properties of the team that are typically dynamic in nature and vary as a function of team context, inputs, processes, and outcomes [ ... ]. [They] describe cognitive, motivational, and affective states of teams” (Marks et al. 2001, p. 357). Research has identified conflicts as one of the most robust mediators between team diversity and team outcome (e.g., Jehn et al. 1999; Pelled et al. 1999; Klotz et al. 2014).

### **Team outcomes: Satisfaction and team efficacy**

Team outcomes are the valued consequences of team activity, for instance, not only performance but also members' affective reactions (Mathieu et al. 2008). Outcomes are often categorized into proximal and distal group outcomes. Distal group outcomes include classic performance measures such as innovation and financial outcomes (e.g., Ancona and Caldwell 1992; van der Vegt and Bunderson 2005). Proximal group outcomes refer to emergent states, such as the cognitive, motivational, and affective states of groups, team viability, and members' satisfaction and commitment (Hackman and Wageman 2005; Balkundi and Harrison 2006). Since distal outcomes may be causally rather distant to the individual team, very idiosyncratic and specific to the teams and team members, more proximal types of outcomes, such as members' satisfaction and affective reactions and viability receive more attention by empirical researchers (Mathieu et al. 2008). Especially in the context of new venture teams, it makes sense to favor proximal outcomes such as team satisfaction and efficacy over financial performance, because financial gain is often not the primary motivation for the founders or even employees (Baule and Soost 2016).

We focus on more proximal and affective outcomes; that is, teams are considered to be performing well if team members believe that their team can manage their tasks and if they are satisfied with the team and wish to remain members of the team. Among proximal outcomes, team satisfaction has traditionally received the most research

attention (e.g., Kirkman and Rosen 1999; Peeters et al. 2006; Mathieu et al. 2008). Independent of the evaluation of the overall team outcomes, team members may also form beliefs about the team's efficacy, which is "a group's shared belief in its conjoint capabilities to organize and execute the course of action required to produce given levels of attainment" (Bandura 1997, p. 447). Although team efficacy and team satisfaction are closely related and often blended, Bandura (1997, 2012) suggests that they are conceptually distinct constructs.

Team efficacy is a highly task-related evaluation of a team, and triggers two mechanisms that positively affect the overall satisfaction with the team. As explained in Bandura's social cognitive theory, team efficacy has a motivating component that leverages effort put into the task by team members, which may result in higher performance; additionally, feeling capable in the tasks that one is exposed to is often positively valued (Bandura 1997; Fuller et al. 2007). Team efficacy has been found to be positively related to many types of group outcomes (e.g., Gibson et al. 2000; Lee et al. 2002; Lester et al. 2002; Pearce et al. 2002; Sivasubramaniam et al. 2002). The separation of a task-related evaluation of a team via team self-efficacy and a general evaluation of a team via team satisfaction is connected to the separation of task-related task conflicts and task-independent relationship conflicts (Amason 1996; de Wit et al. 2012). However, we initially suggest that both team efficacy and team satisfaction are positively related (see Fig. 1 for a summary of our hypotheses).

H1: Team efficacy positively relates to team satisfaction

### Mediators: Task and relationship conflicts

Intragroup team conflicts emerge from perceived incompatibilities among team members (De Dreu and Gelfand 2008) and are highly relevant in determining team functioning and, ultimately, team outcomes (Jehn and Chatman 2000; Jehn and Bendersky 2003). Consequently, a wide range of studies addresses the question of

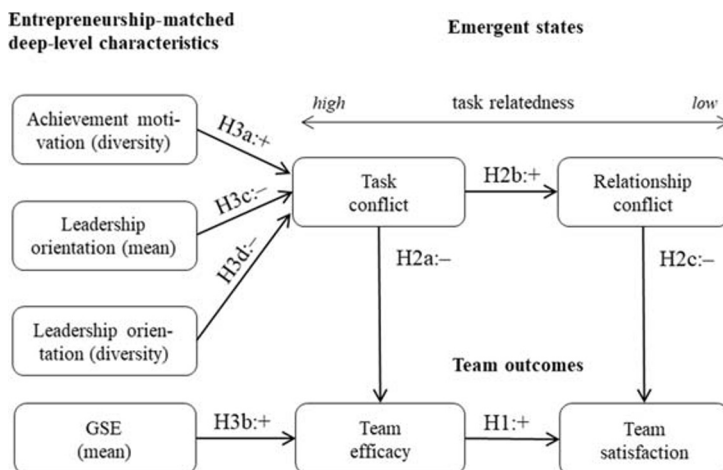


Fig. 1 Hypothesized relationships

how intragroup conflicts either benefit or inhibit team outcomes (e.g., Mohammed and Angell 2004; De Dreu 2006; Langfred 2007; Olson et al. 2007; Parayitam and Dooley 2007; Gamero et al. 2008; Tekleab et al. 2009; Goncalo et al. 2010). The seminal meta-analysis by de Wit et al. (2012, p. 13) summarizes the results of 116 studies on this topic as the “existence of considerable heterogeneity of the [...] different types of intragroup conflict and their relationship with group performance.”

In terms of the types of conflict, the conflict literature (with seminal contributions by Amason et al. 1995) mainly distinguishes between two different types of conflicts, namely, task and relationship conflicts. Task conflict is a cognitive conflict, defined as “task-oriented and focused on judgmental differences about how best to achieve common objectives” (Amason 1996, p. 127). Task conflicts occur when team members disagree about issues such as the “distribution of resources, key decision areas, procedures and policies, or an appropriate action choice” (de Jong et al. 2013, p. 4). Complementary to task conflict, relationship-based affective conflicts emerge when team members disagree about interpersonal styles and personal tastes or socio-cultural norms and values (De Dreu and Weingart 2003) and act out interpersonal clashes characterized by negative feelings and emotions, such as anger, hostility, and frustration (Jehn 1994; Pelled et al. 1999). The patterns of influence of these two types of conflicts on team outcomes differ substantially. Although relationship conflict was found to impair proximal group outcomes in general, the studies on task conflicts yielded mixed results across the literature (De Dreu and Weingart 2003; Hinds and Mortensen 2005; Lau and Murnighan 2005; Raver and Gelfand 2005).

Past research has often suggested that task conflict has the potential to benefit a wide variety of group outcomes (e.g., Amason 1996; Jehn 1995). Task conflicts might be particularly productive for the teams that have undergone excessively homogenizing group think processes (Turner and Pratkanis 1997). Attraction, selection, and attrition processes (known as the ASA framework) may render teams and organizations more homogeneous over time (Schneider 1987), and they may attempt to maintain a shared positive perspective on the functioning of the group and protect their social identity (Janis 1972; Turner and Pratkanis 1998). The resulting lack of conflicts can result in detrimental effects on effective decision making (Turner and Pratkanis 1997). Therefore, moderate task conflict could—despite possibly being uncomfortable—make teams more productive; for instance, teams may benefit through higher creativity (Farh et al. 2010) or greater innovativeness (De Dreu 2006).

De Wit et al. (2012) suggest that task conflicts are less negative or even positive for teams if relationship conflicts and task conflicts are independent, which is a topic that we discuss below. De Wit et al. (2012) also suggest that the effect is less negative for top-management rather than more function-oriented teams. Newly starting teams might still need to work less like top managers and work more in a hands-on manner, such teams also might not have undergone excessively homogenizing group think processes, a condition for particularly positive effects of conflicts. Such teams thrive on very different dynamics than established management teams such that conflicts might not have significant productive effects related to breaking these group think processes. More specifically, the speed of interactions due to small windows of opportunity and dynamic environments are more characteristic of the environments of start-up teams, such that trust and team cohesion might be relatively more important (Kirzner 1997). Hence, in the early-stage phases of a team, despite the potentially positive effects,



conflicts might display pronouncedly negative effects on team satisfaction. Therefore and consistent with other research (e.g., De Dreu and Weingart 2003; Hinds and Mortensen 2005; Lau and Murnighan 2005; Raver and Gelfand 2005), we expect task conflicts to impair team outcomes in general and team satisfaction in particular.

Linking the differentiation between more task-related conflicts and less task-related relationship conflicts to the task-related outcome of team efficacy and the more comprehensive outcome of team satisfaction, we can separate two paths along which task conflicts eventually affect team satisfaction. The first path is deeply rooted in task-related team dynamics and links task conflicts to team outcomes such as team satisfaction solely via its effects on task-related team efficacy. Task conflicts—although they usually originate in the task—can also escalate beyond the task dimension and spill over to the perception of personal dislikes (Guenter et al. 2016). More specifically, “the negative effect of task conflict on proximal team outcomes, such as satisfaction, can be explained by self-verification theory (Swann et al. 2004), which suggests that group members become dissatisfied when they interpret challenges of their viewpoints by other group members as a negative assessment of their own abilities and competencies” (de Wit et al. 2012, p. 3). Mooney et al. (2007) and Guenter et al. (2016) report empirical evidence that task conflict can contribute to relationship conflict. Accordingly, in addition to their task-related effects on team satisfaction through team efficacy, task conflicts may also trigger task-unrelated relationship conflicts.

Relationship conflicts, which are not related to tasks (Jehn 1994), are less likely to affect task-related outcomes such as team efficacy. Hence, if task conflicts spill over into task-unrelated team dynamics, team efficacy will not be affected, but team satisfaction might nevertheless decline. Thus, relationship conflicts directly negatively affect team satisfaction because they deeply relate to people’s identities and social connectedness (Guenter et al. 2016). Being challenged and questioned might emotionally feel like an attack on a person’s self-esteem or a threat to the harmony of the relationship. As a consequence, people might feel dissatisfied.

The following three hypotheses summarize our discussion and establish the outcome-specific effects of task and relationship conflicts and the two paths along which task conflicts affect team satisfaction, which are each identified through one of the two mediators, team efficacy and relationship conflicts:

H2a: Task conflicts negatively relate to team efficacy.

H2b: Task conflicts positively relate to relationship conflicts.

H2c: Relationship conflicts negatively relate to team satisfaction.

### **Team input: Personality-related team composition**

Team composition, which is described as the configuration of member attributes in a team, has a powerful direct influence on team processes and, in turn, team outcomes (Levine and Moreland 1990; Moynihan and Peterson 2001; Zhou 2016).<sup>1</sup> Attributes can generally be categorized into surface-level attributes such as age, gender, ethnicity,

<sup>1</sup> An overview of the recent decades of team composition research since 1990 is provided by the seminal study of Mathieu et al. (2014).



and deep-level characteristics, e.g., personality factors, values, and attitudes (Harrison et al. 1998). Most studies operationalize personality-related deep-level team diversity predominantly based on Big Five (Bell 2007), which refers to extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience (McCrae and Costa 1987). There are, however, forceful calls to expand the range of deep-level diversity to include behavioral styles, values, motives, and beliefs (Mathieu et al. 2008; Bell 2007; Block 1995; Jackson et al. 1995; Mohammed and Angell 2003; Bell 2007).

Once leaving the framework of the Big Five, there is a considerable number of personality characteristics that one might consider. Going beyond the Big Five in entrepreneurship research, Rauch and Frese (2007) suggest examining general personality characteristics concerning their relevance to entrepreneurial task, and they refer to these characteristics as entrepreneurship-matched traits (Rauch and Frese 2007). Rauch and Frese summarize that “the traits that matched to entrepreneurial tasks, such as generalized self-efficacy, proactive personality, innovativeness, and achievement motives, are the factors most strongly related to entrepreneurial behavior” (Rauch and Frese 2007, p. 370). Among these traits, they found the traits with the highest relevance to entrepreneurial behavior are achievement motives (McClelland 1963; Levine and Rubinstein 2017) and generalized self-efficacy (e.g., Verheul and Mil 2011). Based on Rauch and Frese’s findings, we included achievement motivation and general self-efficacy as deep-level entrepreneurial task-matched characteristics. Although achievement motivation is strongly related to general self-efficacy (e.g., Robbins et al. 2010; Bandura 2012; Vancouver 2012; Bledow 2013), we will observe that their effects on team dynamics are likely to differ tremendously.

### Achievement orientation

At first glance, one might expect that the teams that aim at high levels of performance indeed perform better and are therefore more satisfied. However, satisfaction results from meeting one’s individual goals rather than from meeting an externally formulated objective (McClelland 1963; Lumpkin and Dess 1996). Although a team with an overall high achievement motivation may objectively perform better, its members can not—per se—be expected to be able to perform according to their aspirations and, thus, meet their aspirations and be satisfied. Higher aspirations might lead not only to higher performance, but also to higher risks of not meeting these aspirations. It is, therefore, difficult to derive a hypothesis about the association between the mean level of achievement motivation and both team efficacy and team satisfaction. Therefore, we do not expect a clear-cut association between the mean level of achievement motivation and subjective team outcomes such as team efficacy and team satisfaction.

Diversity in achievement motivation, however, might lead team members to pursue different goals and invest substantially different levels of effort, which could ultimately lead to more conflicts. Achievement motivation correlates with and, therefore, aligns the “hope for success” and fear of failure (Heckhausen 2013). If team members vary in their achievement ambitions, they will also vary in their willingness to fight hard to succeed (Heckhausen 2013), which can ultimately create more conflicts among them. Consequently, if team members have similar levels of achievement motivation, we can expect fewer conflicts, and because achievement motivation is a task-related dimension, this might particularly hold for task conflicts. Due to the emerging task conflicts,

diversity in achievement motivation hurts team satisfaction through both lower team efficacy and possible escalations into relationship conflicts. Hypothesis H3a summarizes our expectations regarding the effects of team compositions with respect to achievement motivations.

H3a: Greater diversity in team members' achievement motivation increases task conflicts.

### General self-efficacy

Although entrepreneurship research also studies entrepreneurial self-efficacy (e.g., Baum and Locke 2004; Mueller and Dato-on 2013; Zhao et al. 2005), we specifically consider general self-efficacy, which is defined as “individuals’ perceptions of their ability to perform across a variety of situations” (Judge et al. 1998, p. 170). In contrast to leadership orientation and achievement motivation, general self-efficacy is a belief and not a motivational construct. The intrapersonal nature of the construct suggests that a high self-efficacy does not primarily direct the individual towards social interaction. For this reason, we do not expect a team’s composition concerning general self-efficacy to affect conflicts, but we assume only a direct effect on team efficacy and subsequently on team satisfaction (Lent et al. 2006). Therefore, the level of general self-efficacy indirectly affects team satisfaction through its effect on task-related team efficacy.

H3b: A higher level of team members’ self-efficacy increases the level of team efficacy.

### Leadership motivation

Since leadership orientation is strongly related to both achievement motivation and self-efficacy (McClelland and Boyatzis 1982; Robbins et al. 2010) and has been increasingly recognized as crucial for establishing and growing new ventures (e.g., Chandler and Hanks 1994; Baum et al. 1998; Daily et al. 2002; Gupta et al. 2004; Hmieleski and Ensley 2007; de Jong et al. 2013; Knipfer et al. 2018; Zhou 2016), we added leadership orientation as a third entrepreneurship-matched deep-level characteristic. McClelland (1975) described a construct called “leadership motive” or an “empire-building pattern” (measured by a high-power motive, a low affiliation motive, and high self-control) in relation to the managerial success of nontechnical leaders. In the context of a team approach to the leadership motive, Zhou (2016) and Ensley et al. (2006) studied the concept of shared leadership within new venture teams. Ensley et al. (2006) found that a high leadership orientation in all team members accounts for 15% of the variance in start-up performance above and beyond the variance accounted for by the vertical leadership of founding CEOs.

Given that leadership is focused on the team and its task, we expect task conflicts to be particularly affected. Based on the findings of Ensley et al. (2006), we suggest that a greater leadership orientation in all team members increases the team’s tendency to

rotate leadership, eventually resolve conflicts actively, and move ahead more quickly. Consequently, we expect that the mean average level of leadership orientation in a team reduces task conflicts and thereby indirectly increases team efficacy, indirectly decreases relationship conflicts, and ultimately increases team satisfaction.

However, we believe that not all team members can effectively lead simultaneously, and homogeneous leadership motivations could thus be incompatible. Consequently, homogeneity in leadership orientation can also become a source of conflict in a team. In contrast, diversity in leadership orientation is likely to reduce conflicts related to how to lead the team in performing the task. Accordingly, we expect that a higher within-team variance in leadership orientation will reduce task conflicts and thereby indirectly increases team efficacy, indirectly decreases relationship conflicts, and ultimately increases team satisfaction. Although leadership orientation and achievement orientation are positively associated, it is important to note that we expect opposite effects for related diversities, that is, diversity in leadership orientation promotes incompatible motivation, whereas achievement motivation promotes compatible motivations. Hypotheses 3c and 3d summarize our expectations regarding the effects of leadership orientation.

H3c: A higher level of team members' leadership orientation decreases task conflicts.

H3d: Greater diversity in team members' leadership orientation decreases task conflicts.

## Method

### Sample

We collected data from 133 teams that comprised 665 students, who participated in a start-up simulation as part of a university course on business fundamentals. The sample consisted of engineering (52%) and business students (48%). The mean age was 22.5 years, and the share of female students was 24%. The facilitators organized teams of five individuals each; 42% of the participants were fully randomly assigned to teams, and for 58%, the randomization was controlled (based on an initial personality survey) such that the variation between the teams was increased for variables such as achievement motivation and general self-efficacy (for a detailed description of an equivalent procedure see Weiss and Brettel 2010).

Although the use of student samples is often controversial in the entrepreneurship and general management research, exposing the students to a start-up simulation provides unique methodological advantages, i.e., control over the team composition and context and less heterogeneity in idiosyncratic experiences with respect to the study subject, which allow us to reliably isolate the effect of team composition on the emergence of conflicts (e.g., Bell 2007, and for similar arguments in different contexts, see Bello et al. 2009; Hsu et al. 2017; Bönnte et al. 2016; Williams et al. 2019). In the field, there is usually a pre-selection of team members based on friendship or previous work relations or even forced team compositions based on managers' or venture capitalists' expectations about which

teams are more successful than other teams. The observed teams are also more likely to be formed a long time before the time of investigation and may have already undergone substantial adjustments in their team to improve the team's performance. Some of the teams may already have dissolved. Due to these selections, adjustment, and survival effects, observational field research observes only a particular subset of team compositions, which can substantially bias and thereby reduce the desired reliability of the analysis of team success factors (Bell 2007). By enforcing particular randomized team compositions immediately before the observed team performance, we avoid the biases that result from adjustment, survival, and sample selection.

Second, based on a meta-analysis, Bowers et al. (2000) conclude that the nature of the tasks strongly affects the relationship between team configuration and team outcomes. However, differences in tasks are difficult to control for in real-life venture settings as they are usually highly specific, heterogeneous, and often difficult to classify due to their complexity. As a consequence, real-life venture team studies are likely to suffer from omitted variable biases. By assigning the same task to all teams, we guarantee the comparability of the task and a stable and comparable task environment and thus substantially reduce related biases.

Furthermore, the fact that three of the largest companies in the world in 2016 by market capitalization (Apple, Alphabet, and Microsoft; moreover Facebook ranks 7th) were founded solely by university students between the ages of 19 and 25 years suggests that students are also a very relevant population for entrepreneurship research.

### Study design and experimental setup

The experimental design followed a rigorous setup, comparable to the procedure reported by Mathieu and Schulze (2006) and builds on the fundamentals for simulations by Davis et al. (2007). We build on an initial questionnaire that measured personality traits. Subsequently, the students were assigned to equally sized teams of five students. For the start-up simulation, we employed the “TOPSIM easyStartup!” simulation tool, which was embedded in a real-life setting, where the participants interacted with the facilitators who played roles, such as venture capitalists.

All teams were assigned to markets, and each was represented by five competing teams (instead of a remaining market of 3 teams, two markets were formed by four teams). The simulation ran for six periods over two days, which represented six consecutive business years. After the simulation experiment, the participants reported their perceptions of their team dynamics and team performance.

Every team started with a seed capital of EUR 20,000. In the course of the simulation, the participants performed the typical tasks of a start-up process. The participants started with a preparation phase, where they checked the feasibility of opening a surfboard shop and developed a comprehensive six-year business plan for the business. For their research, the participants used a simulated Internet, which provided some information, and they could also acquire information by purchasing data from a simulated market research institute. The participants could consider information related to product line, life-cycle, demand, target group, and positioning. They presented their business plan to fictitious venture capitalists played by the facilitators. During this phase, the participants were able to acquire capital for shares

of their companies. Additional fund-raising rounds occurred in a real-life negotiation setting with the facilitators acting as venture capitalists. During the game, the teams had the chance to acquire more debt or equity against shares. The founding teams made qualitative and quantitative decisions related to the organizational legal form, the supply chain, production, marketing, sales, communication, human resources, finance and accounting, location, and information management such that a good mix of strategic and operational levels of decision-making was ensured.

The actual business simulation lasted for six periods, which represented the six consecutive business years that the teams had to forecast in their business plan. Before each period, the teams had to make a wide range of decisions, adapt their strategies, set new goals, and make entrepreneurial decisions. These decisions formed the basis for the computer-based simulation of the next period. After each period, the teams received a balance sheet, a profit and loss statement, and information on new market developments, including competitors' performances, and external events that influenced the market such as changes in taxation or labor market fluctuations. For example companies, when experiencing a crisis, could hire consultants (played by facilitators), apply for bank loans, or go into fundraising mode again. After the last period, the team with the highest company success was nominated as the winner in this particular market. Company success was defined as a composite variable from the business plan, cumulated periodic success, development of the equity ratio, and stock valuation.

## Variables

### Team outcomes

*Team efficacy* was measured with the following four items taken from Edmondson (1999) and Högl (1998): "Our team was convinced of its own abilities", "Our team never doubted that they were up to the task", "Our team had above-average abilities", and "If we as a team bring time and commitment, we can achieve everything." Participants responded on a 5-point-Likert scale that ranged from "strongly disagree" (1) to "strongly agree" (5). The responses were averaged. Both the individual-level reliability ( $\alpha = 0.81$ ) and the inter-rater agreement (median  $rw_{G(J)} = 0.89$ ) were acceptable.

*Team satisfaction and viability* represent the two essential components of subjective team outcomes (Kozlowski and Ilgen 2006). Team satisfaction was measured with three out of five items developed by Tekleab et al. (2009), e.g., "I really enjoyed working in this team." We excluded two items from the scale that do not fit our context, because they referred to students handing in final reports and to their performance over multiple weeks. Team viability was measured with the five-item scale of Tekleab et al. (2009), e.g., "If I had the chance, I would have changed the team." Participants responded on a 5-point-Likert scale that ranged from "strongly disagree" (1) to "strongly agree" (5). The responses to the items were averaged. As both measures correlated strongly at the individual ( $r = 0.85$ ) and team ( $r = 0.84$ ) levels and factor analyses at the individual level did not indicate the presence of two factors, we formed a composite score for the team outcomes, which we refer to as *team satisfaction*. For the composite measure, the individual-level reliability ( $\alpha = 0.95$ ) and inter-rater agreement (median  $rw_{G(J)} = 0.96$ ) were acceptable.

## Emergent states: Conflicts

*Task and relationship conflicts* were each measured by a three-item scale taken from Lechler (2001), e.g., “The decision-making process provokes frequently personal conflicts between the founders” and “Referring to basic decisions entrepreneurial team members often disagree.” Participants responded on a 5-point-Likert scale that ranged from “strongly disagree” (1) to “strongly agree” (5). The responses were averaged. Factor analyses that extracted two factors with oblique rotation indicate that the items load on their corresponding factors with a load above 0.55, while the cross-loadings are below 0.15. At an individual level, the correlation between these factors is 0.49. Consistent with prior research (e.g., Amason 1996), these observations indicate that relationship conflicts and task conflicts are related but distinct constructs. For relationship conflicts, the individual-level reliability ( $\alpha = 0.80$ ) and inter-rater agreement (median  $rw_{G(J)} = 0.80$ ) were at acceptable levels. For task conflicts, the individual-level reliability ( $\alpha = 0.71$ ) was acceptable; inter-rater agreement (median  $rw_{G(J)} = 0.77$ ) was rather low but close to acceptable levels.

## Team input: Composition of deep-level characteristics

To operationalize our explanatory variables that reflect the deep-level composition of teams, we follow what Moynihan and Peterson (2001) describe as the configuration approach and included the teams’ means and diversity (operationalized as standard deviations) of the matched entrepreneurial traits, achievement motivation, leadership orientation, and general self-efficacy.

*Achievement motivation* was measured with three items from Hermans’s (1970) well-known achievement motivation questionnaire. Despite the known weaknesses of self-reported measurements, this particular questionnaire is still used frequently and has also more recently been shown to have strong predictive power (Hustinx et al. 2009). Participants evaluated the following statements on a 5-point-Likert scale that ranged from “strongly disagree” (1) to “strongly agree” (5): “Others think of me that I work very hard/do much for my studies”, “I usually do more than is required of me”, and “When I work/learn for my studies, the demands I make on myself are very high”. The responses were averaged ( $\alpha = 0.70$ ).

*Leadership orientation* was measured with five items by Lorr and More (1980), e.g., “I work best in a group when I’m the person in charge.” Participants responded on a 5-point-Likert scale that ranged from “strongly disagree” (1) to “strongly agree” (5). The responses were averaged ( $\alpha = 0.80$ ).

*General self-efficacy* was measured with the following four items ( $\alpha = 0.73$ ) from Schwarzer et al. (1997): “I always succeed in solving difficult problems when I make an effort”, “In unexpected situations I always know how to act”, “Whatever happens, I can handle it”, and “I find a solution for every problem.” Participants responded on a 5-point-Likert scale that ranged from “strongly disagree” (1) to “strongly agree” (5). The responses to the items were averaged ( $\alpha = 0.73$ ). We included both the mean and standard deviation among all team members.

We included several team-level control variables. We control for the mean and diversity (standard deviation) of cognitive ability, which is approximated by the



participants' A-level grades, for the share of females and gender diversity by including dummies for no females, one female, and more than one female (i.e., 2, 3, or 4) and for whether the team was completely randomly composed. Table 1 provides a summary of the descriptive statistics and correlations at the team level.

## Results

To test our hypotheses, we employ structural equation modeling (SEM) to simultaneously estimate all equations and to test both the direct (see Table 2, Main model) and indirect effects (see Table 3 based on the Main model). In terms of the structural model used to test the mediating effects, we follow Preacher and Hayes (2008), who suggested that sound tests of mediation need to control for all direct effects that possibly bypass the hypothesized indirect effects. Therefore, a team's personality characteristics are allowed to directly influence any of the following mediating and dependent variables: task and relationship conflicts, team efficacy, and satisfaction. Both task and relationship conflicts are allowed to influence team efficacy and satisfaction directly, and team efficacy is allowed to affect satisfaction. The control variables are included in all equations. In our specific context, the specification of the structural equation model is equivalent to seemingly unrelated regression analyses, as recommended by Preacher and Hayes (2008), for the analysis of the indirect effects. To estimate the indirect effects, we calculate the products of the coefficients of all covered paths and test their statistical significance based on bootstrapping their confidence intervals (Preacher and Hayes 2008). To simplify the interpretation of the estimated coefficients and to compare the effect sizes, we standardize all dependent variables and all deep-level variables that our hypotheses refer to, that is, team satisfaction, team efficacy, tasks and relationship conflicts, and the means and standard deviations of team members' achievement motivation, leadership orientation, and general self-efficacy. Since the interactions within the individual virtual markets (of each four to five start-ups) may trigger market-specific dynamics that affect team dynamics within the teams related to the specific market, we estimate a model that includes fixed effects for all 27 virtual markets and estimate standard errors that are clustered at the market level (see Table 4). Figure 2 summarizes the empirically observed relationship.

### Emergent states and team output

In support of our Hypothesis 1, Table 2 reveals that team efficacy positively relates to team satisfaction; the coefficient of team efficacy in the equation for team satisfaction is large and statistically significant. Hypothesis 1 is also consistently supported in the robustness check. Therefore, the belief of being a functional and capable team is associated with team satisfaction and the resulting viability of a team.

The estimated coefficients of task conflicts in the equations for team efficacy and relationship conflicts in both the main model and the robustness check strongly support our hypotheses that task conflicts negatively affecting team efficacy (H2a) and possibly escalate into relationship conflicts (H2b). Furthermore, Hypothesis 2c on relationship conflicts negatively affecting team satisfaction is consistently supported.



**Table 1** Summary statistics and binary correlations for team-level variables

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>Team outcome</b>																	
1. Team satisfaction	4.47	0.35	1														
2. Team efficacy	4.09	0.34	.54***	1													
<b>Emergent states</b>																	
3. Task conflict	2.38	0.40	-.30***	-.27**	1												
4. Relationship conflict	1.49	0.31	-.23**	-.00	.42***	1											
<b>Deep-level composition</b>																	
5. Achievement motivation (mean)	3.43	0.33	-.02	.19*	.05	.09	1										
6. Achievement motivation (diversity)	0.68	0.22	.20*	.11	-.21*	-.21*	-.09	1									
7. Leadership orientation (mean)	3.41	0.29	.07	.24**	-.10	.06	.42***	.02	1								
8. Leadership orientation (diversity)	0.65	0.25	.08	.03	-.21*	-.14	-.09	.08	-.25**	1							
9. General self-efficacy (mean)	3.70	0.24	-.05	.28**	.06	.03	.25**	-.12	.20*	-.10	1						
10. General self-efficacy (diversity)	0.55	0.20	.10	-.03	-.04	.01	-.12	.25**	-.07	.05	-.25**	1					
<b>Control variables</b>																	
11. Mental ability (mean)	2.25	0.29	.01	.03	-.20*	.03	-.19*	.14	-.28**	.03	.00	.19*	1				
12. Mental ability (diversity)	0.60	0.19	-.14	-.15	.08	.01	-.19*	.05	-.13	.08	-.05	.02	.10	1			
13. No females	0.24	0.43	.04	.20*	.07	.11	.25**	-.10	.14	.01	.18*	-.18*	-.08	-.02	1		
14. One female	0.44	0.50	.04	-.10	-.06	.13	-.03	-.02	-.18*	-.02	-.14	.22*	.20*	-.14	-.50***	1	
15. More females	0.32	0.47	-.08	-.07	-.01	-.23**	-.20*	.10	.05	.01	-.02	-.07	-.14	.16	-.39***	-.61***	1
16. Group formation: fully random	0.42	0.50	.05	-.01	.11	-.06	-.01	-.21*	-.00	-.09	.07	-.12	-.13	-.00	.16	-.07	-.07

N = 133 teams. S.D. = standard deviation

Significance levels: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$

**Table 2** Regression analysis: Main model

Dependent variable	Task conflict		Relationship conflict		Team efficacy		Team outcome	
Mediating outcome								
Team efficacy							0.58	(0.08)***
Emergent states								
Task conflict			0.41	(0.08)***	−0.30	(0.09)***	−0.04	(0.08)
Relationship conflict					0.13	(0.09)	−0.20	(0.08)*
Deep-level composition								
Achievement motivation (mean)	0.05	(0.09)	0.09	(0.09)	0.09	(0.09)	−0.07	(0.08)
Achievement motivation (diversity)	−0.18	(0.08)*	−0.13	(0.08)	0.11	(0.08)	0.07	(0.07)
Leadership orientation (mean)	−0.22	(0.09)*	−0.04	(0.08)	0.03	(0.08)	0.01	(0.07)
Leadership orientation (diversity)	−0.23	(0.10)*	0.04	(0.09)	0.07	(0.09)	−0.00	(0.08)
General self-efficacy (mean)	0.07	(0.09)	−0.04	(0.08)	0.25	(0.08)**	−0.16	(0.07)*
General self-efficacy (diversity)	0.06	(0.09)	0.00	(0.08)	0.05	(0.08)	0.08	(0.07)
Control variables								
Mental ability (mean)	−0.75	(0.30)*	0.35	(0.29)	0.07	(0.30)	−0.18	(0.26)
Mental ability (diversity)	0.50	(0.43)	0.18	(0.40)	−0.60	(0.41)	−0.24	(0.36)
One female	−0.16	(0.21)	−0.01	(0.20)	−0.37	(0.21)	0.10	(0.18)
More females	−0.25	(0.23)	−0.48	(0.21)*	−0.26	(0.22)	−0.09	(0.19)
Group formation	0.01	(0.17)	−0.25	(0.16)	0.04	(0.16)	0.15	(0.14)
Constant	1.52	(0.74)*	−0.62	(0.70)	0.42	(0.72)	0.48	(0.63)
Log likelihood	−1757.6133							
Observations	133							
Equation-level R-squared	0.17	0.28		0.24		0.42		

Structural equation model. Standard errors in parentheses

Significance levels: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$

The observed effects establish two indirect paths along which task conflicts affect team satisfaction; one is related to the team task, and one path is unrelated to it (compare Fig. 1). The task-related path is based on task conflicts reducing team efficacy, the belief to be able to solve the required task as a team, and team efficacy positively affecting team satisfaction. This indirect effect is strong and statistically significant (see Table 3). The second path is not task-related but relationship-related. Independent of their effects on team efficacy, task conflicts can escalate into relationship conflicts, which negatively affect team satisfaction. This indirect effect is also strong and statistically significant (see Table 3).

We observe that the effects of task and relationship conflicts differ substantially. The effects of task-related conflicts on team satisfaction work only via task-related team

**Table 3** Indirect effects on team satisfaction

Path	Effect	95%-confidence interval		
		Coefficient	Low	High
Emergent states				
Task conflict – team efficacy – team satisfaction	−0.176**	−0.332	−0.058	
Task conflict – relationship conflict – team satisfaction	−0.080**	−0.162	−0.025	
Deep-level composition				
Achievement motivation (diversity) – task conflict – team efficacy – team satisfaction	0.032*	0.004	0.084	
Achievement motivation (diversity) – task conflict – relationship conflict – team satisfaction	0.015*	0.002	0.045	
Leadership orientation (m) – task conflict – team efficacy – team satisfaction	0.038*	0.008	0.100	
Leadership orientation (m) – task conflict – relationship conflict - team satisfaction	0.017*	0.003	0.050	
Leadership orientation (diversity) – task conflict – team efficacy – team satisfaction	0.041*	0.007	0.112	
Leadership orientation (diversity) – task conflict – relationship conflict – team satisfaction	0.019*	0.003	0.059	
General self-efficacy (m) – task conflict – team efficacy – team satisfaction	0.144**	0.044	0.291	

The table only reports the longest significant paths, i.e. significant paths that are part of longer paths are not reported. Reporting bias-corrected and accelerated bootstrapped confidence intervals (10,000 repetitions). Statistical significance at the level of  $\alpha$  based on whether the  $(1 - \alpha)$ -confidence interval covers zero

Significance levels: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , +  $p < 0.10$

efficacy, whereas the effects of relationship conflicts are unrelated to task-related team efficacy. By testing the statistical asymmetry between task and relationship conflicts, we find that the direct effect of task conflicts is indeed much stronger on team efficacy than on team satisfaction (diff = −0.26, S.E. = 0.12,  $p = 0.03$ ). Correspondingly, the direct effect of relationship conflicts is much weaker (and even absent) on team efficacy than its effect on team satisfaction (diff = 0.32, S.E. = 0.12,  $p < 0.01$ ). Accordingly, these analyses establish that with respect to the effects on emergent states and team outcomes, we can separate task-related from task-unrelated processes, whereas a link is established by task conflicts possibly escalating into relationship conflicts.

### Team input: Deep-level team composition

We conclude by analyzing the antecedents to the above-described team dynamics, i.e., the team composition concerning achievement motivation, leadership orientation, and general self-efficacy. An important first observation is that none of the deep-level characteristics relate directly to relationship conflicts. Although this does not preclude the existence of small effects, it indicates that within an entrepreneurial context, task conflicts relate more strongly to the task-matched characteristics.

**Table 4** Robustness check: Including fixed effects for markets and clustered standard errors

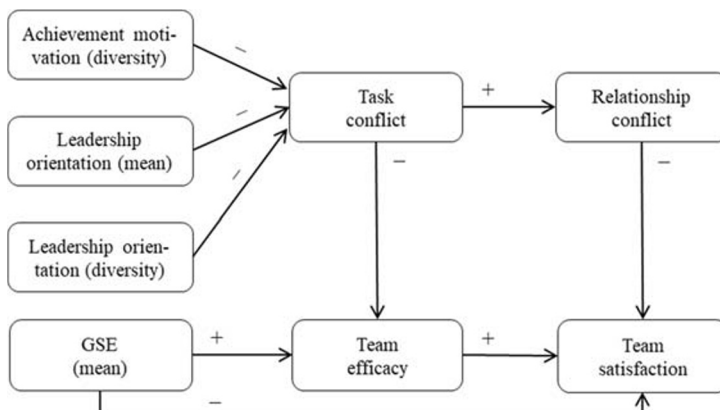
Dependent variable	Task conflict		Relationship conflict		Team efficacy		Team outcome	
Mediating outcome								
Team efficacy							0.60	(0.11)***
Emergent states								
Task conflict			0.36	(0.10)***	−0.28	(0.12)*	−0.09	(0.07)
Relationship conflict					0.07	(0.09)	−0.18	(0.06)**
Deep-level composition								
Achievement motivation (mean)	0.02	(0.09)	0.02	(0.10)	0.08	(0.09)	−0.07	(0.10)
Achievement motivation (diversity)	−0.20	(0.09)*	−0.16	(0.09)	0.15	(0.07)*	0.01	(0.08)
Leadership orientation (mean)	−0.29	(0.12)*	0.01	(0.11)	−0.03	(0.12)	−0.10	(0.10)
Leadership orientation (diversity)	−0.22	(0.11)*	−0.09	(0.10)	0.01	(0.09)	−0.06	(0.07)
General self-efficacy (mean)	0.08	(0.09)	0.00	(0.08)	0.32	(0.09)***	−0.15	(0.09)
General self-efficacy (diversity)	0.11	(0.09)	0.05	(0.11)	0.08	(0.06)	0.13	(0.07)

$N=133$ . Structural equation model. Standard errors in parentheses. Control variables omitted, but the same control variables were included as in models reported in Table 2

Significance levels: \*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$

## Achievement motivation

Consistent with our prior reasoning, we do not find any effect, neither direct nor indirect, of the team's mean of achievement motivation on team satisfaction. Furthermore, we have to reject Hypothesis 3a, which suggests that diversity in achievement motivation increases task conflicts. In contrast to our expectations, we find a statistically significant negative effect, that is, variance in achievement motivation reduces task conflicts. We discuss this finding in the discussion section. Independent of this lack of support for Hypothesis 3a for the direction of the effect, the effect of achievement motivation on team satisfaction is, as expected, mediated by task conflicts. As



**Fig. 2** Empirically observed relationships

established above, the effect of task conflicts on team satisfaction is mediated along the two paths through team efficacy and relationship conflicts.

### **Leadership orientation**

Regarding leadership orientation, we find significant support for Hypotheses 3c and 3d that suggest that overall higher levels and higher diversities of leadership orientation are associated with lower levels of task conflicts (Table 2). The results are stable even when controlling for market fixed effects and market-based interactions between teams (see Table 4). Consequently, there are two indirect effects each for the mean and the diversity in leadership orientation on team satisfaction, namely, both the task-related effect through team efficacy and the task-unrelated effect through relationship conflicts (Table 3).

### **General self-efficacy**

In contrast to the achievement motivation and leadership orientation, general self-efficacy is not related to team conflicts. However, in support of Hypothesis 3b, we observe that higher levels of self-efficacy of individual team members increase the level of team efficacy. As a consequence, there is an indirect positive effect of self-efficacy on team satisfaction, which is mediated by team efficacy but not by any of the two conflict types (Table 3).

In our main model, we observe an additional, not hypothesized negative effect of general self-efficacy on team satisfaction. It is not significant at the 5% level in the robustness check but is significant only at the 10% level. Since the equation includes team efficacy as a statistical control, this negative effect has to be interpreted carefully but will turn out to be interesting for team dynamics. An increase in the average of team members' self-efficacy unrelated to a corresponding increase in team efficacy, i.e., if team members believe themselves to be better but do not believe that the entire team is better, will trigger dissatisfaction with the entire team over and above any effect of team efficacy and team satisfaction. Therefore, a disconnection between individual-level and team-level self-efficacy could be an implicit mechanism through which the negative effect of low levels of team satisfaction might be further leveraged.

## **Discussion and conclusion**

This study aims to shed light on the empirical and theoretical inconsistencies revealed by prior studies. These inconsistencies concern how conflicts, specifically, task conflicts, affect new venture team outcomes — in particular satisfaction — through two major levers: first, the spillover effect into personal conflicts and, second, the mediating effect through team efficacy. Inspired by Klotz et al. (2014), we contribute to research along two lines. First, we explore how conflicts originate in the deep-level sphere of human characteristics and thereby focus on the characteristics matched with entrepreneurship. Second, we analyze how conflicts eventually play a mediating role in the relation between the personality-related composition of the founding team and the resulting team outcomes. We discuss our findings in five steps. First, we elaborate on

the effects of entrepreneurship-matched personality characteristics on conflicts. Second, we describe not only how different types of conflicts affect one another but also team efficacy and team satisfaction. Third, we discuss the mediated relationship between teams' personality-related diversity and team outcomes. Fourth, we focus on the practical implications of our findings, and fifth, we briefly discuss the limitations and the aspects of our study that future research might be able to improve.

### Entrepreneurship-matched deep-level team diversity

Our findings support Klotz et al.' (2014) expectation that entrepreneurship-matched characteristics may offer a differentiated perspective as opposed to focusing on the general Big Five character traits, which were all found to significantly relate to either task or relationship conflicts or to both types of conflicts (e.g., de Jong et al. 2013). Our empirical analysis reveals that a greater variance in both leadership orientation and achievement motivation is associated with fewer task conflicts. The unexpectedly negative effect of a greater variance in achievement motivation deserves further research to investigate whether it is a robust finding or a methodological artifact, e.g., resulting from the use of a self-reported scale to measure achievement motivation. Although often used and validated (e.g., Hustinx et al. 2009) in business research, psychologists often rightly criticize self-reported scales and suggest implicit motive scales (e.g., McClelland 1975; McClelland and Boyatzis 1982). We leave the measurement issue for future research and nevertheless suggest a substantive interpretation of our findings.

Over and above diversity in achievement motivation possibly creating conflicts that result from motivational heterogeneity, team members with different achievement levels may utilize their different achievement levels in coordination processes. That is, a person with low achievement motivation and a person with high achievement motivation might not engage in an active task conflict, but they might both gladly accept the suggestions brought forward by the "high-achiever." More generally, depending on the specificities of the tasks, a team might allocate efforts and decision-making based on the heuristic that the people who want the most simply also do the most and make decisions. The specific education-related context of our study (which involved a limited effort and the outcome possibly being only of minor importance to the participants), might render such a heuristic extremely acceptable. Consequently, this would cause the diversity in achievement motivation to reduce task conflicts. For real entrepreneurial teams where one's own income that secures one's earning a living is at stake, the case might be different such that diversity in achievement motivation might indeed and as initially hypothesized be positively rather than negatively associated with conflicts.

The effect of a high mean level of leadership orientation in the team indicates that at least one team member has to have a very high leadership score to influence the team score. A strong team leader (with high levels of leadership orientation and achievement motivation) is a welcomed source of orientation, which, in turn, reduces conflicts, especially given that the founding stage of a young venture is characterized by high uncertainty (as it is also induced in our study setup).

As predicted, a team's composition with respect to general self-efficacy does not affect conflicts, but it directly affects team efficacy (Lent et al. 2006). This observation

can be explained by the intrinsically intrapersonal nature of the individual perception of oneself, which is not primarily directed towards social interaction. A team member with a high level of self-efficacy might have a meta-effect on the team (demonstrated here by a high degree of team efficacy) but may not engage in conflicts *per se*. However, the actual dialog about the nature of self-efficacy (Bandura 2012; Vancouver 2012; Bledow 2013) might eventually explain how self-efficacy forms and transforms over time both within individuals and in teams.

Finally, as expected, none of the personal characteristics relate directly to relationship conflicts because achievement motivation and leadership orientation are strongly related to the entrepreneurial task and, therefore, more strongly affect task conflicts. However, this effect might also be explained by our research focus, in which the team members did not know one another for very long and stayed together only for the brief simulation time. We observe that task conflicts may escalate into relationship conflicts. Such an escalation might be quicker if team members have a history with one another and when they have more time. Over time the initial task conflict might resolve, and current task conflicts will no longer be the reasons for possibly persisting relationship conflicts such that over time, relationship conflicts will be related to team composition independent of the current level of task conflicts. We urge future research to consider such temporal perspectives of emerging and disappearing task conflicts and possible differences in the persistence of conflicts across types of conflicts.

### **Task and relationship conflicts and team outcomes**

We find a statistically significant negative effect of task conflicts on team satisfaction. Although these findings are contrary to de Jong et al. (2013) and other conflict research (e.g., Jehn 1995; Amason 1996), they are consistent with other research and in particular, with the reviews by de Wit et al. (2012) and De Dreu and Weingart (2003). The rationale behind this finding is that task conflicts increase cognitive load. Such conflicts also interfere with effective cognitive processes and may result in narrow, black-and-white thinking, thereby obstructing distal group outcomes such as group effectiveness or decision making (De Dreu 2006). Already in our conceptual discussion, we have emphasized that the possibly positive effects of task conflicts might be more prevalent for established teams and over a longer course of time when group think and convergence to homogeneous teams might hinder team performance. Therefore, for newly formed teams, it might be more important to invest efforts in making a mutually acceptable decision and executing it promptly (and, if necessary, correcting it in due time) than to enter into a dispute about the best possible intellectually derived idea.

Furthermore, we advance research and support the findings that suggest that the effects of conflicts differ across outcome categories (de Wit et al. 2012). By drawing on Bandura's (1997) social cognitive theory, we differentiate team efficacy and team satisfaction as separate, distinguishable outcomes. We demonstrate that both outcomes are affected differently by task and relationship conflicts. Task conflicts affect team satisfaction along two distinct paths, through either task-related team efficacy or escalation into relationship conflicts, whereas relationship conflicts affect a team's satisfaction without team efficacy being a relevant intervening factor. In contrast, task conflicts did not lead to a direct disturbance of satisfaction, unless they caused the team



to lose team efficacy. In this sense (i.e., that task conflicts do not reduce team satisfaction if they do not cause declines in team efficacy and do not escalate into relationship conflicts), our results are still consistent with task conflicts being less detrimental than relationship conflicts for team satisfaction. The observation of conflict-type-specific reactions and effects on perceived team efficacy and satisfaction provides indirect evidence that team members — consciously or subconsciously — differentiate between these two types of conflicts. We thereby offer initial evidence that team members separate task conflicts from relationship conflicts, as questioned by de Wit et al. (2012).

### The mediating role of team conflicts

We find that the personality-related variables in the founding team have a significant impact on new venture performance through the mediation effect of conflicts. We provide support for the findings of de Jong et al. (2013), who pioneered the examination of the mediating role of conflicts in the personality-team outcome relation in the entrepreneurial context. We responded to their call to apply a multiple-informant setup that includes all team members when investigating the deep-level characteristics constellation and the conflict behavior of teams. Our findings show that conflicts mediate the relationship among leadership orientation, achievement motivation, and general self-efficacy, on the one hand and team efficacy and satisfaction on the other hand. One important observation is that the two *interpersonal* motivation-related personality characteristics (leadership orientation and achievement motivation) are mediated through task conflicts, while the *intrapersonal* motivational characteristic of self-efficacy (Bledow 2013) is not mediated by conflicts but directly affects team efficacy. Conflicts thus seem more likely to be driven by interpersonal rather than intrapersonal characteristics.

Concerning the mediating effects, there is an unexpected but, after reconsidering, seemingly intuitive effect that draws our attention to the multi-level nature of team processes. We observe a positive effect of self-efficacy on team satisfaction through increased team efficacy, which is not surprising. To the contrary and more surprising, we observe a mild negative effect of team members' average level of general self-efficacy on team satisfaction once team efficacy is controlled for. That is, if team members have a higher level of individual general self-efficacy, which does not translate into more positive judgments of team efficacy, a team would be less satisfied. The dissatisfaction might result from realizing that individual abilities cannot translate into a better functioning team. Although team efficacy is unambiguously positive, individual levels of self-efficacy may have detrimental effects on satisfaction. The interplay between the indirect and direct effects of individual levels of general self-efficacy becomes crucial for understanding team satisfaction, which is a finding that might inspire future research on the multi-level nature of team processes.

Our study intends to fuel the current discussion about whether individual-level characteristics in a team directly or indirectly influence team performance (Mackey 2008; Klotz et al. 2014). Our study adds to the understanding of how team personality affects team performance through conflicts. Our specific findings partly deviate from the results of de Jong et al. (2013) in that not all of our deep-level variables predict task and relationship conflicts. Together with Klotz et al. (2014), we encourage an ongoing

focus on differentiated deep-level dimensions and an investigation of the causes and conditions in which they lead to conflict behavior in new venture teams. Our findings indicate that the characteristics that can be described as motivational and interpersonal (such as leadership orientation and achievement motives) influence task conflicts, whereas intrapersonal characteristics (such as self-efficacy) do not influence task conflicts.

## Practical implications

An important message to all practitioners is that personality matters—beyond the degree in which it is currently addressed professionally (Ling et al. 2007). Intuitively and most of the time informally, venture capitalists and private investors search for the “entrepreneurial-minded” person to invest in, but there are rarely any systematic assessments of the personality of the lead founder; even rarer are any investigations of team personality or other deep-level diversity dimensions. However, we know that many start-ups currently fail in the early stage of their existence because of intragroup conflicts (Marmer et al. 2012). Interestingly, all institutional and private investors clearly agree on investing in people rather than in companies, however, the myriad of available due diligence tools is largely restricted to examinations of legal structures, finances, key business partners, and intellectual property. Assessment tools for people or deep-level team diversity and dynamics are rarely used.

With our study, we encourage entrepreneurs and investors to seriously consider the personality characteristics of the founding team members, specifically by introducing a professional assessment of the individual personalities in a team and understanding the deep-level diversity structure and its effects. This type of assessment also requires investors and entrepreneurs to obtain more education and training in this field if they are to interpret the results and ultimately address the consequences.

Diversity per se — whether at the deep- or surface-level — is not a competitive advantage at all but can harm a team if diversity-induced misunderstandings escalate into disruptive conflicts. However, diversity can also potentially be turned into a competitive advantage if the variety of the individual members’ needs is made apparent and is mutually and respectfully addressed with the goal of integrating and actively managing the diversity to the greatest benefit of the team and its increased effectiveness. Investors and entrepreneurs can derive two main advantages from personality assessments, which are (1) obtaining a better general appreciation of the effects of personalities and how these potentially influence team dynamics, which would help them compose, develop, or grow teams and (2) actively developing approaches to integrate and manage diversity to the greatest benefit of the team.

Furthermore, greater clarity on how conflicts evolve and how they affect team outcomes would mark a breakthrough, especially for practitioners such as entrepreneurs and venture capitalists. Our results on the roles of the two types of conflicts deliver practical insights for both entrepreneurs and venture capitalists who might want to focus more intently on relationship conflicts and even engage in active education about conflict management, mediation practices and resolution techniques. Task conflicts might be turned into potential benefits for team outcomes if management and team practices (i.e., design thinking workshops) succeed in actively utilizing the diversity reflected and the stimulating atmosphere created by task conflicts. Relationship

conflicts, in contrast, are more threatening to the existence of a team because they negatively influence the willingness of the team members to continue. Such conflicts should therefore always be avoided and resolved, and corresponding management practices need to be actively adopted. Not only do relationship conflicts need to be managed, an organization should also aim to develop group practices that systematically prevent the escalation of task conflicts into relationship conflicts. This can be as simple as implementing rules such as using “I statements” when criticizing other people’s ideas; this highly effective practice will ultimately lead to a culture of constructive disputes. Another effective method is to educate team members to increase their social perceptiveness toward the personality-related thinking styles of the other team members and find a common reference language to address different viewpoints, e.g., through training with personality tools that use simple color codes for different personality styles.

Another insight for practitioners is the finding that a high level of self-efficacy in a team leads to a high level of perceived team efficacy. Following this logic, this relation would mean that it is worthwhile to engage a member with a high level of self-efficacy for the purpose of stimulating team efficacy, which, in turn, positively relates to satisfaction and also generally to performance.

Finally, our differentiation between team efficacy and satisfaction may be a valuable piece of knowledge for investors and entrepreneurs; indeed, both groups might want to keep in mind that not everything that makes team members feel effective and capable also supports their happiness and willingness to continue. This insight opens an entirely new discussion about the origin of burnout and emotional exhaustion and offers potential new approaches to prevention.

Accordingly, in addition to our general appeal that personality matters and should therefore be considered, greater clarity about or even measures to determine how a team deals with conflicts would be a breakthrough for the entrepreneurship and venture capital world. Furthermore, by understanding the team- and individual-level factors that trigger individuals within teams to engage in intragroup conflicts, practitioners may be able to understand and manage team conflicts even more effectively.

## Limitations

We strongly believe that this study sheds new light on team dynamics in the context of entrepreneurship, but like most research, it also has weaknesses. We discuss four of these weaknesses in more detail. First, we used a student sample and chose the methodology of self-reported scales to measure deep-level diversity in personality characteristics and a computer-based start-up simulation as the context for team performance. In the method section, we have already emphasized several advantages of student samples concerning the identification of the causal effect of team composition on team outcomes (cf., Bello et al. 2009). In our study, we emphasize internal reliability. Future research might further probe the generalizability of our findings. For the negative effect of task conflicts on team outcomes and the unexpected positive effect of diversity in achievement motivation on conflicts, we already discussed conditions that may change these effects in field settings. Future research might also probe the use of different measurement instruments for the deep-level characteristics. For instance, it might be worthwhile to replicate our study with more elaborated,

psychological, implicit motive measures, such as the picture story exercise (PSE; Schultheiss and Pang 2007), which is a further development of the classic thematic apperception test (TAT; Murray 1943), the operant motive test (OMT; Kuhl and Scheffer 1999), or the multi-motive grid (MMG; Sokolowski et al. 2000). These implicit measures might be even more appropriate to measure deep-level achievement motivations than the explicit achievement motivation measure that we employed. Relatedly, constructs such as self-efficacy might be better conceptualized as dynamic within-person relations rather than as steady states (Bledow 2013).

Second, in our study, the teams engaged in only a limited number of repeated interactions, and the start-up game almost exclusively focused on the founding stage of a new venture. Although this focus allows us to be rather confident in concluding about the causal effects of team composition on dynamics in newly formed teams, team dynamics are likely to change with more and longer interactions (Schneider 1987; Turner and Pratkanis 1998). By applying more long-term research perspectives, further studies could focus on the long-term impact of team composition. We might expect that over time, the dynamics might become more path-dependent and also might become more detached from the initial conditions, including the initial team composition and team members' deep-level characteristics.

Third, the selection of deep-level variables in our study is not exhaustive. It was designed to provide a new perspective on the relevance of entrepreneurship-matched traits in a team setting and the consequences on team performance mediated through conflicts. Being aware that the Big Five model remains the most frequently used approach, we dedicated our efforts to expanding the field of deep-level diversity research by using other dispositional variables—with the caveat that these are not equally well-established. Future research might include both established and explorative personality scales and investigate which scales are most likely to have a direct or an indirect effect on venture outcomes. In this case, a broader database and a wider array of deep-level diversity dimensions, such as motives, attitudes, and beliefs (Mohammed and Angell 2003) and, more specifically, entrepreneurship-matched traits, would be highly relevant (Klotz et al. 2014). Future research might also examine other team characteristics, such as leadership styles and the characteristics of the lead founder, that potentially mitigate the effects of a team's deep-level personality dimensions as drivers of task conflicts.

Fourth, our research provides initial evidence on team members differentiating between task conflicts and relationship conflicts and suggests that task conflicts may escalate into personal conflicts. We strongly encourage further research to investigate the temporal patterns of conflict types within teams and performance over time (Jehn and Mannix 2001). Exploring whether the periods in which task and relationship conflicts co-occur are more or less productive periods for a team than times in which such conflicts do not co-occur or in which overall fewer conflicts exist could yield interesting insights. We recommend that future research focuses more on such time-related aspects of intragroup conflicts, how personality characteristics trigger these conflicts, and how they possibly change or even change direction over time.

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## Compliance with ethical standards

**Disclosure statement** The authors have no conflicts of interest to declare.

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