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A Behavioral Perspective of the Entrepreneurial Group: Exploring the Impact of Team Design, Cognitions, and Group Dynamics on Entrepreneurial Outcomes

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List of abbreviations and acronyms

BvD	Bureau van Dijk
CEO	Chief Executive Officer
cf.	confer (compare)
CI	Confidence interval
Dr. rer. pol.	Doctor rerum politicarum
e.g.	exempli gratia (for example)
et al.	et alii (and others)
i.e.	id est (that is)
IMR	Inverse mills ratio
MBA	Master of Business Administration
NACE	Nomenclature of Economic Activities
p	p-value
PhD	Doctor of philosophy
Prof.	Professor
ROA	Return on assets
SD	Standard deviation
SE	Standard error
TUM	Technical University of Munich
VIF	Variance inflation factor
vs.	versus
ß	Regression coefficient

Abstract

In private firms, the collective actions of entrepreneurial groups shape firm-level outcomes in an undiluted manner. Entrepreneurial groups are conceptualized as collaborative entities involved in the firms' strategic decision-making. Group members who *own* the firm occupy a prominent position because they have the ultimate authority to decide on the allocation of the firm's resources according to their idiosyncratic cognitions. However, little is known about how individual owners' cognitions, under the influence of emergent group processes, feed into the *collective cognition* of the group and influence entrepreneurial outcomes. In my dissertation, I examine the influence of entrepreneurial groups' collective cognition on two key indicators of private firm performance, namely firm growth and survival. Shedding light on both the bright and dark sides of firm growth and survival, I also discuss the escalation of entrepreneurial groups' commitment to a failing firm and how *excessive* growth can counteract firm survival. Overall, the dissertation's theorizing and rich empirical insights contribute to knowledge about the role of entrepreneurial groups' collective cognition in their firms' development.

1 General introduction

In private firms, *collective cognition* (i.e., the organization and distribution of knowledge within a group that allows groups to make assessments and judgments [cf. Mol, Khapova, & Elfring, 2015]) of an entrepreneurial group shapes firms' development and performance in an "undiluted" and direct manner (Felin & Zenger, 2017; Knight, Greer, & De Jong, 2020; Shepherd, 2011; Staw, 1991). Within these entrepreneurial groups, broadly defined as collaborative groups involved in firms' strategic decision-making (cf. Ruef, 2010)[1], owners of the firm are central actors. This centrality is rooted in the fact that owners have the ultimate decision-making authority to align their firms' strategy with their idiosyncratic theories and judgment about how to create value (Foss & Klein, 2012; Foss, Klein, Lien, Zellweger, & Zenger, 2021; Schulze & Zellweger, 2021). Thus, a better understanding of how entrepreneurial groups—most importantly firm owners—collectively form their judgment and make decisions (i.e., their collective cognition) likely helps to explain the much-documented heterogeneity in private firms' growth and survival prospects (Brüderl, Preisendörfer, & Ziegler, 1992; Frese & Gielnik, 2014; Gimeno, Folta, Cooper, & Woo, 1997; Penrose, 1959).

However, it is inherently difficult to investigate how entrepreneurial groups' collective cognition materializes and how it affects firm-level outcomes, resulting in a dearth of empirical studies on the one hand and scholarly calls to better understand its emergence and consequences on the other hand (Patzelt, Preller, & Breugst, 2021; Shepherd, Wennberg, Suddaby, & Wiklund, 2019; West III, 2007). This difficulty mainly stems from the fact that a groups' collective cognition is not a simple aggregation of each individual group member's cognitions

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[1] It is notable that this definition of an entrepreneurial group recognizes various actors as part of the group (e.g., family members who influence key decision makers within the group without being formally part of *the upper echelons* of this firm). As such, it is similar to, but not the same as, typical definitions of new venture (entrepreneurial) teams. For instance, Klotz, Hmieleski, Bradley, and Busenitz (2014: 227) introduce new venture teams as "the group of individuals that is chiefly responsible for the strategic decision-making and on-going operations of a new venture". Accordingly, I consider new venture teams, or entrepreneurial teams, as particular sub-types of entrepreneurial groups (see also Knight, Greer, & De Jong, 2020).

(Bougon, 1992; Dreu & West, 2001; Nijstad & Dreu, 2012), but a consequence of the interplay between individual group members' cognitions and emergent group processes (Breugst, Preller, Patzelt, & Shepherd, 2018; Grégoire, Corbett, & McMullen, 2011; Mitchell, Busenitz, Lant, McDougall, Morse, & Smith, 2002; West III, 2007). For example, when making strategic decisions, group members often suppress their critical perspectives in order to maintain group harmony and unanimity, but at the expense of finding an "optimal" strategy (Janis, 1971, 1972; Kerr & Tindale, 2004). These so-called *groupthink patterns* can have negative implications for important entrepreneurial outcomes, such as firms' survival prospects, for example, when non-critical deliberations polarize groups toward taking irrational risks (Isenberg, 1986; Moscovici & Zavalloni, 1969).

While dysfunctional group processes, such as groupthink, inevitably occur to some degree in any group interaction, certain structural features of groups (e.g., power differences among group members [Tost, Gino, & Larrick, 2013], friendship or family ties [Francis & Sandberg, 2000], or the size of the group [Amason & Sapienza, 1997]) make them more or less likely to occur (Janis, 1971, 1972; Sunstein & Hastie, 2014). Thus, to be able to explain how an entrepreneurial group's collective cognition influences important entrepreneurial outcomes, I consider both group members' individual cognitions as critical "inputs" to the collective decision-making process and structural features of the group (or the group design, cf. Stewart, 2006) as important antecedents of various group processes throughout the dissertation. In terms of entrepreneurial outcomes, I investigate firm growth and survival (including escalation of commitment as a facet of firm survival), both of which outcomes are closely related to the collective cognition of an entrepreneurial group. Indeed, because these outcomes are the consequence of critical strategic decisions, they typically are based on each individual group member's input and extensive collective deliberation (Frese & Gielnik, 2014; West III, 2007).

More specifically, I investigate firm growth and survival for two main reasons: First, they are the most important organizational indicators of performance for private firm, elevating

the practical relevance of my dissertation's findings. Firm survival is a key indicator of a private firm's superior and "competent" strategic decision-making because private firms are particularly vulnerable to early failure (e.g., a quarter of all new ventures do not survive the first year [Shane, 2008]). Moreover, firms need to grow to overcome their liability of newness and smallness (Brüderl & Schüssler, 1990; Stinchcombe, 1965) and to compete with their larger competitors (Brüderl et al., 1992; Davidsson, Delmar, & Wiklund, 2017; Delmar & Shane, 2006; Penrose, 1959). Second, entrepreneurship scholars have also considered the "dark sides" of firm growth and survival (cf. Genedy, Hellerstedt, Naldi, & Wiklund, 2024), as evidenced by entrepreneurs' pursuit of excessive firm growth at the expense of survival (Delmar, McKelvie, & Wennberg, 2013) or their persistence in poorly performing ventures (Gimeno et al., 1997; Huang, Souitaris, & Barsade, 2019; Kier, McMullen, & Kuratko, 2022; Ruhnka, Feldman, & Dean, 1992; Zhang & Cueto, 2017) (i.e., escalation of commitment). Both of these dark sides can again be well linked to both individual cognitions (e.g., preferences) and dysfunctional group processes (e.g., groupthink).

In summary, the research objective for my dissertation is to shed light on how the interplay between individual entrepreneurial group members' cognitions and emergent group processes shapes firm growth and survival in private firms. In Chapter 1.1 below, I introduce the key constructs used in my dissertation and elaborate on selected subfacettes of each of these constructs. Those subfacettes are important for the derivation of three specific research questions, to which I turn in Chapter 1.2.

1.1 Overview of key constructs

On the highest level, I follow West III (2007: 77) in arguing that "collective cognition mediates between individual cognitions and firm actions and performance", resulting in the overarching framework presented in Figure 1.

Group members' individual cognitions	Entrepreneurial groups' collective cognition	Entrepreneurial outcomes
Ownership competence Role-congruent preference Escalation preference	Collective cognition influenced by group structure and associated group processes	Firm growth Firm survival Escalation of commitment
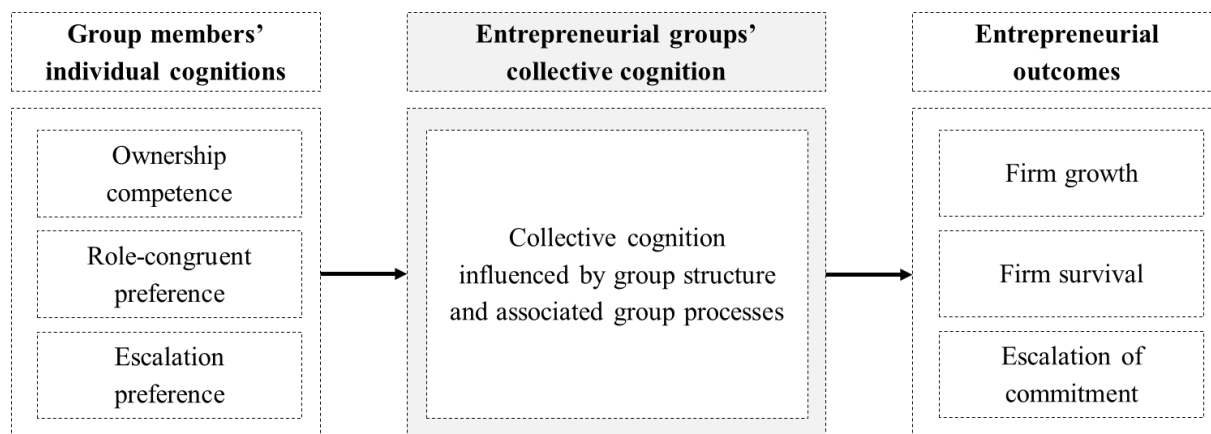
Figure 1. Key constructs for dissertation

In the following, I define the constructs 'individual cognitions' 'collective cognition' and 'entrepreneurial outcomes' displayed in Figure 1 and explain the choice of each of the corresponding subfacettes.

1.1.1 Individual cognitions

In the context of entrepreneurship, individual cognitions are defined as "the knowledge structures that people use to make assessments, judgments or decisions involving opportunity evaluation and venture creation and growth" (Mitchell et al., 2002: 97). Scholars taking a cognitive perspective to explain entrepreneurial behavior (Baron, 1998, 2004, 2007; Grégoire et al., 2011; Mitchell et al., 2002; Mitchell et al., 2007) follow the broad assumption that "behaviour proceeds from complex interactions between the environment and the mind" (Grégoire et al., 2011: 1446). Thus, such a cognitive perspective helps to shed light on how entrepreneurs' cognitive biases (Hmieleski & Baron, 2009; Keh, Foo, & Lim, 2002; Zhang & Cueto, 2017) or their prior knowledge (Shane, 2000; Shepherd & DeTienne, 2005) and human capital (Gruber, Dencker, & Nikiforou, 2023) influence opportunity evaluations and firm performance, contingent on "environmental" conditions, such as the intra-team context (for a review see Grégoire et al., 2011).

A focus on entrepreneurial cognitions is also evident in recently emerging literature on the strategic role of owners in firms' value creation. This literature highlights the importance

of owners' idiosyncratic cognitions, such as their beliefs about how firm resources should be allocated toward value creation. In particular, previous work has emphasized how owners differ both in their theories of value (Felin & Zenger, 2009, 2017; Schulze & Zellweger, 2021) and in the quality of their judgment in formulating and executing these theories of value (Foss et al., 2021; Foss & Klein, 2012, 2020; Zellweger & Zenger, 2023). Since owners have the ultimate decision-making authority to allocate firm resources consistent with their idiosyncratic judgment and theories of value (Alchian, 1961; Alvarez, Zander, Barney, & Afuah, 2020), owners' differences in their cognitions should have particularly strong implications for the performance of their firms (Fitza & Tihanyi, 2017). In my dissertation, I thus particularly focus on the role of owners' cognitions (more precisely their judgment and preferences) in their firms' development, which—due to owners' substantial decision-making authority—likely serve as critical input factors shaping entrepreneurial groups' collective cognition.

For example, Foss et al. (2021) introduced the idea that firms' value creation depends on ownership competence (with the subcomponents of matching competence ["what to own"], governance competence ["how to own"], and timing competence ["when to own"]), which reflects the use of ownership as an instrument for value creation and highlights differences in the *quality* of owners' judgment (i.e., their competence). Other work focuses on how owners differ in their definitions of value, such as the preference of owner-managers for preserving control in their firms even if it counteracts performance (Schulze & Zellweger, 2021; Wasserman, 2017). Also, much research discusses the implications of *role-congruent preferences* of women business owners that tend to define value more in terms of non-financial and "communal" goals vis-à-vis performance goals (Apesteguia, Azmat, & Iriberri, 2012; Yang & Aldrich, 2014). Importantly, owners' preferences and competences are intertwined in influencing their cognitions. For instance, an owner's *escalation preference* may be driven by low levels of timing competence; in other words, maladaptive judgment concerning the

question if she is still the best owner of the firm's resources (Foss et al., 2021; Schulze & Zellweger, 2021).

To summarize, I build on the assumption that a better understanding of individual owners' cognitions should help to explain their firms' development, at least to some extent. However, the process of how an entrepreneurial group develops their collective cognition should pave the path for an even more nuanced understanding of how these individual cognitions translate to entrepreneurial outcomes.

1.1.2 Entrepreneurial groups' collective cognition

I define an entrepreneurial groups' collective cognition in line with Mol et al. (2015) and West III (2007) as an emergent state arising from the interactions among group members and their individual cognitions that provide the knowledge base "for making predictions and inferences about how to act, the likely probability of success, and how best to allocate resources" toward achieving important entrepreneurial outcomes (West III, 2007: 80). Importantly, collective cognition can be considered the product of both individuals' cognitions and concomitant group processes that combined yield the input factor for subsequent processes and decision-making within the group (Mol et al., 2015). Thus, the definition employed in my dissertation emphasizes the key role of group processes that determine how individual cognitions are aggregated to a groups' collective cognition.

Previous research has elaborated on how groups perform particularly well when members actively exchange and integrate their unique perspectives (Breugst et al., 2018; DeChurch & Mesmer-Magnus, 2010; Knight et al., 2020; Mesmer-Magnus & DeChurch, 2009) and when groups develop shared mental models (Klimoski & Mohammed, 1994; Lim & Klein, 2006; Mohammed & Dumville, 2001). However, groups are often not able to *reap the benefits* of the multiplicity of different perspectives (or cognitions in a broader sense) within a group (Kerr & Tindale, 2004; Sunstein & Hastie, 2014). Indeed, groups are often vulnerable to

dysfunctional decision-making driven by groupthink and group polarization. Groupthink relates to a group's desire to achieve consensus at the expense of the realistic appraisal of a situation (Janis, 1971, 1972; Janis & Mann, 1977), while group polarization describes group members' adjustment of opinions toward extrema after group discussions (Isenberg, 1986; Moscovici & Zavalloni, 1969). Both group processes are believed to be a consequence of persuasive arguments by certain group members (Vinokur & Burstein, 1974) and even more importantly, reputational pressures within the group, "which lead people to silence themselves or change their views in order to avoid some penalty" (Sunstein & Hastie, 2014: 92).

Importantly, these and other group processes are partly a consequence of group composition, which typically follows early group formation decisions (Healey, Bleda, & Querbes, 2021; Lazar, Miron-Spektor, Agarwal, Erez, Goldfarb, & Chen, 2020; Lazar, Miron-Spektor, Chen, Goldfarb, Erez, & Agarwal, 2022). For instance, relational ties among group members may facilitate the coordination of knowledge and complementary tasks (Francis & Sandberg, 2000), but they also invite groupthink phenomena in which group members "become motivated to avoid being too harsh in their judgments of their leaders' or their colleagues' ideas" (Janis, 1971: 84). Other examples describe how women involvement in groups promotes critical deliberation (Chen, Leung, Song, & Goergen, 2019; Farh, Oh, Hollenbeck, Yu, Lee, & King, 2020; Post, Lokshin, & Boone, 2022) and hinders groups' polarization toward risk (Chen et al., 2019; Kaplan, 2008). Thus, in my dissertation, I focus on structural features of groups (such as groups' relational structure or gender composition) as a proxy for emergent group processes that change how entrepreneurial group members' individual cognitions aggregate to the groups' collective cognition, and ultimately influence key entrepreneurial outcomes.

1.1.3 Entrepreneurial outcomes

In terms of entrepreneurial outcomes, I focus on firm growth, firm survival, and escalation of commitment, because they can all be well linked to collective cognition of the entrepreneurial group, for the following reasons.

With regard to firm growth, the works of Edith Penrose takes a towering position (Lockett, Wiklund, Davidsson, & Girma, 2011; Penrose, 1952, 1955, 1959). In explaining how firms grow, Penrose and scholars following her tradition emphasize the importance of the judgment of the firms' entrepreneurs and relationships within an entrepreneurial group that guide the firms' actions. Specifically, Penrose (1959) elaborates on how *sound judgment* on behalf of the firms' decision-makers, as well as the quality of cooperation among group members represent important antecedents of firm growth (Barney & Wright, 1998; Bird & Zellweger, 2018; Lechler, 2001). Thus, Penrose's ideas align well with my dissertation's focus on collective cognition that may help to explain when the group's judgment is "more or less sound" and how preferences of different members of an entrepreneurial group are integrated to reach a decision, contingent on structural features of the group.

Similarly, a collective-cognition perspective may help to explain why some firms fail and others do not. Apart from economic reasons (Audretsch, 1995; Brüderl et al., 1992; Delmar et al., 2013), researchers focused on the psychological microfoundations of firm survival (Delmar & Shane, 2006; DeTienne, Shepherd, & Castro, 2008; Gimeno et al., 1997; Kalleberg & Leicht, 1991). For instance, previous research has suggested and has provided evidence that entrepreneurs' overconfidence (Gudmundsson & Lechner, 2013; Hayward, Shepherd, & Griffin, 2006) and fallible judgment (Hogarth & Karelaia, 2012) negatively affects firm survival, while previous founding experiences positively affect firm survival (Delmar & Shane, 2006). These results can be considered two sides of one coin (i.e., the quality of one's judgment) and emphasize how imperfect judgment on behalf of the entrepreneurial group endangers firm survival. For example, group polarization, and thus distorted collective cognition, is often tied

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to the pursuance of risk-entailing strategies (Camerer & Lovallo, 1999; Hayward et al., 2006) that make firms vulnerable to failure (Chen et al., 2019; Ho, Huang, Lin, & Yen, 2016; Kaplan, Sørensen, & Zakolyukina, 2022).

Another important entrepreneurial outcome that is closely related to individual cognitions and emergent group processes within an entrepreneurial group is a groups' *escalation of commitment* (Staw, 1976, 1981), the tendency to overcommit to a failing course of action. In fact, there is evidence that groups are even more likely to escalate their commitment than individuals (Bazerman, Giuliano, & Appelman, 1984; Whyte, 1993, 1998) because group members tend to disproportionately focus on arguments in favor of escalation of commitment, while critical arguments as to why continuing may be irrational are insufficiently discussed. As such, the arguments of individuals that *prefer* escalation tend to find more weight in joint discussions and thus are more prominent in groups' collective cognition (Whyte, 1993).

1.2   Development of research questions

In the following, I develop three research questions, all of which revolve around entrepreneurial groups' collective cognition. Each of these research questions focuses on a selected combination of entrepreneurial group members' individual cognitions, a group structure (as a proxy for certain group processes), and at least one of the presented entrepreneurial outcomes.

Specifically, throughout the dissertation, I focus on group members' competences and preferences as key differences in their *individual cognitions* (these individual cognitions serve as critical inputs to groups' collective decision-making). In terms of *group structure*, I focus on relational structure (e.g., whether an entrepreneurial group consists of friendship ties or family ties), power structure, and other compositional features (e.g., gender composition and group size) due to their close association with group processes (e.g., groupthink and group polarization) that shape how individual cognitions are aggregated into the groups' collective cognition and ultimately manifest themselves in *entrepreneurial outcomes*. In Table 1, I provide

a brief summary of the key constructs within these *three categories* and indicate how I use these constructs in the following chapters of the dissertation.

Table 1. Use of "overarching" constructs throughout dissertation

Chapter	Individual Cognitions	Group Structure	Entrepreneurial outcome
II	Ownership competence	Family ties; Org. structure	Firm growth
III	Role-congruent preference	Gender composition; Group size	Firm growth; Firm survival
IV	Escalation Preference	Friendship ties; Power structure	Escalation of commitment

In concordance with the choice of constructs for the dissertation, I rely on a variety of theoretical frameworks to develop the following research questions: The burgeoning literature on the strategic role of ownership (e.g., Foss et al., 2021), Penrosean growth theory (Penrose, 1959), social role theory (Eagly, 1987), groupthink theory (Janis, 1972) and the theory of escalation of commitment (e.g., Brockner, 1992; Staw, 1981). In what follows, I present three unique research questions and explain how answering each question—by investigating the collective cognition of entrepreneurial groups—advances knowledge within the respective theoretical perspectives.

1.2.1 Ownership competence and firm growth: The intersection of the strategic ownership literature and Penrosean growth theory

The burgeoning theoretical work on the strategic role of ownership emphasizes that owners have the ultimate decision-making authority to allocate firm resources consistent with their idiosyncratic judgment under Knightian uncertainty (Alvarez et al., 2020; Foss et al., 2021; Foss, Klein, Lien, Zellweger, & Zenger, 2023). Importantly, prior work (mostly theoretical in nature) suggests that owners differ both in their theories of value (Felin & Zenger, 2017; Zellweger & Zenger, 2023) and in the quality of their judgment in formulating and executing

these theories of value (Foss et al., 2021; Foss & Klein, 2020). In addition, the effect of owners' judgment on firms' value creation is likely to vary across different contexts (Foss, Klein, & Bjørnskov, 2019), such as that the organizational context enables or constrains the exercise of owners' judgment (Foss et al., 2021).

In my dissertation, I draw on recent theoretical work on *ownership competence* (reflecting the accuracy with which judgment is exercised [cf. Foss et al., 2021]) that— embedded in the context of the structure of an entrepreneurial group—likely shapes entrepreneurial outcomes, such as firm growth (Kor, 2003; Lockett et al., 2011; Penrose, 1952, 1955, 1959). Specifically, Penrose (1959) and scholars following her tradition, elaborate on how *sound judgment* on behalf of the firm's decision-makers is an important antecedent of firm growth and highlights how relationships among group members "have often as important an influence […] as do the inherent characteristics of the individuals themselves" (Penrose, 1959: 29). However, her theorizing does not pertain to what underlies sound judgment, such as the nature of the competences residing in the upper echelons of the firm and how sound judgment is enabled or constrained by other members of the group, pointing to an intriguing research gap.

In private firms, ownership is typically concentrated in a few individuals who are often managers of their firms (Foss et al., 2021; Schulze & Zellweger, 2021). Thus, especially in owner-managed firms, the *ownership competence* of one individual (i.e., the owner-manager) immediately and substantially influences firm growth. However, private, owner-managed firms are often characterized by family involvement (Aldrich & Cliff, 2003; Zellweger, Chrisman, Chua, & Steier, 2019), and can differ in the degree of professionalization of the organizational structure (i.e., in how much decision-making authority is centralized in the owner-manager) (Uhlaner, Wright, & Huse, 2007). Thus, the relationship between ownership competence and firm growth is likely subject to boundary conditions rooted in characteristics of the entrepreneurial group (and by extension the firm) (Foss et al., 2019): First, in family firms, other actors from an owner-manager's family likely influence whether and how (and which)

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ownership competences can enfold. In addition, the degree of professionalization of the organizational structure alters the extent to which owners exercise "original" judgment (rather than delegating the exercise of judgment to managers) (Foss et al., 2019).

Inspired by the complementarity of the strategic ownership literature and Penrosean growth theory, in line with my dissertation's scope, I develop a research question that sheds light on how an individual cognition (i.e., ownership competence) relates to an entrepreneurial outcome (i.e., firm growth) contingent on different group structures (e.g., family ties within the firm) and associated group processes that enable or constrain the effect of ownership competence on firm growth. Formally, I pose the following research questions: *(1) How does ownership competence affect firm growth in private firms, and (2) what are the boundary conditions for the effect of ownership competence on firm growth?* (see also von Nitzsch, Bird, & Saiedi, 2024). Figure 2 provides a simplified presentation of how this research question contributes to the overarching research objective of my dissertation.
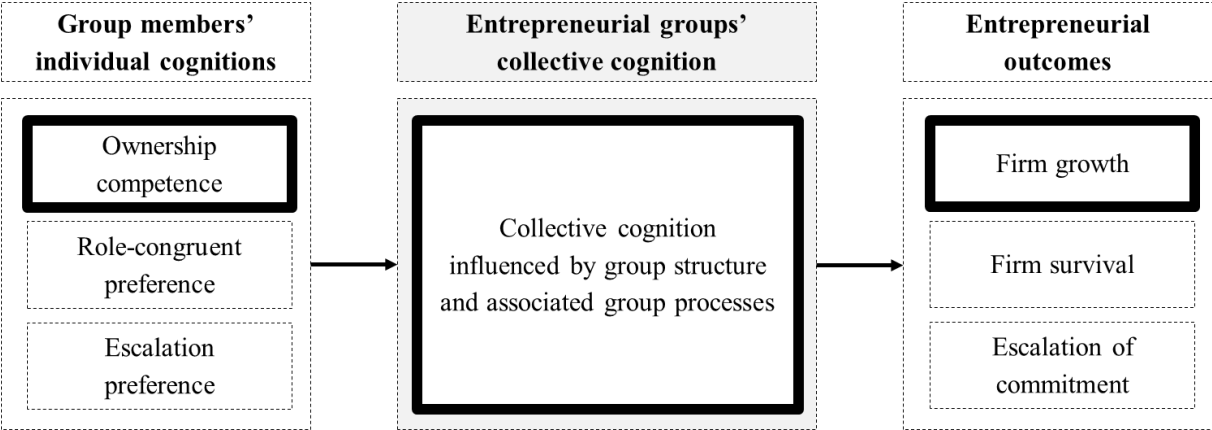
Figure 2. Key constructs in Chapter 2

1.2.2 Owners' gender composition and firm growth and survival: The intersection of the strategic ownership literature and social role theory

As delineated above, owners differ both in their quality of judgment (as reflected in their competence) and their theories of value (as reflected in their preferences). An observable owner characteristic that has been associated with unique and definable preferences is an owner's biological sex. In particular, previous research—building on social role theory—has described how men and women differ substantially in their *communal* (women) and *agentic* (men) preferences (Eagly, 1987; Eagly, Johannesen-Schmidt, & van Engen, 2003). These preference differences appear to be robust across different contexts, including the business context (Croson & Gneezy, 2009; Eagly et al., 2003). Although there has been a growing interest in ownership-related topics lately, there is still limited knowledge about how owners integrate their potentially divergent preferences regarding resource allocations in joint decisions. Thus, studying the gender composition of an entrepreneurial group appears to be another promising avenue for advancing knowledge about how entrepreneurial groups derive their collective cognition.

Specifically, social role theory implies that men and women owners are likely to differ in their strategic preferences for their firms (Tang, Nadkarni, Wei, & Zhang, 2021), such as how to balance performance and non-pecuniary goals (Apesteguia et al., 2012; Guzman, Oh, & Sen, 2020). Embedded into an entrepreneurial group, men's preference for "action-first" strategies and risk-taking (Chen et al., 2019; Post et al., 2022) may polarize the group toward pursuing risk-entailing strategies and growth, while women's social proclivities may facilitate critical deliberation and thus result in a more balanced strategy, benefiting firm survival (Chen et al., 2019; Farh et al., 2020; Post et al., 2022). Thus, predictions inferred from social role theory suggest a potential differential effect of women's and men's (individual) preferences on firm growth and survival, relationships that are yet underexplored in the context of entrepreneurial groups. Indeed, the group context is particular interesting because of the

interplay of these individual preferences with emergent group processes. These group processes are likely to differ as a function of group size (Amason & Sapienza, 1997; Edmondson, 2003). For instance, larger groups may be more likely to polarize toward risk, and conflicts—due to preference differences—are more likely to emerge.

In summary, integrating the strategic ownership literature with social role theory allows to examine an individual's cognition (i.e., role-congruent preference) and its interplay with the group structure (group size) and related group processes in shaping entrepreneurial outcomes (here: firm growth and firm survival). This theoretical scope is reflected in the following research question (note that entrepreneurial groups are referred to as owner teams to align with the more narrow focus of this research question): *How and under what conditions does an owner team's gender composition affect (1) firm growth and (2) firm survival?* Figure 3 provides a simplified presentation of how this research question contributes to the overarching research objective of my dissertation.

Group members' **individual cognitions**	**Entrepreneurial groups'** **collective cognition**	**Entrepreneurial** **outcomes**
Ownership competence		Firm growth
Role-congruent **preference**	Collective cognition influenced by group structure and associated group processes	Firm survival
Escalation preference		Escalation of commitment
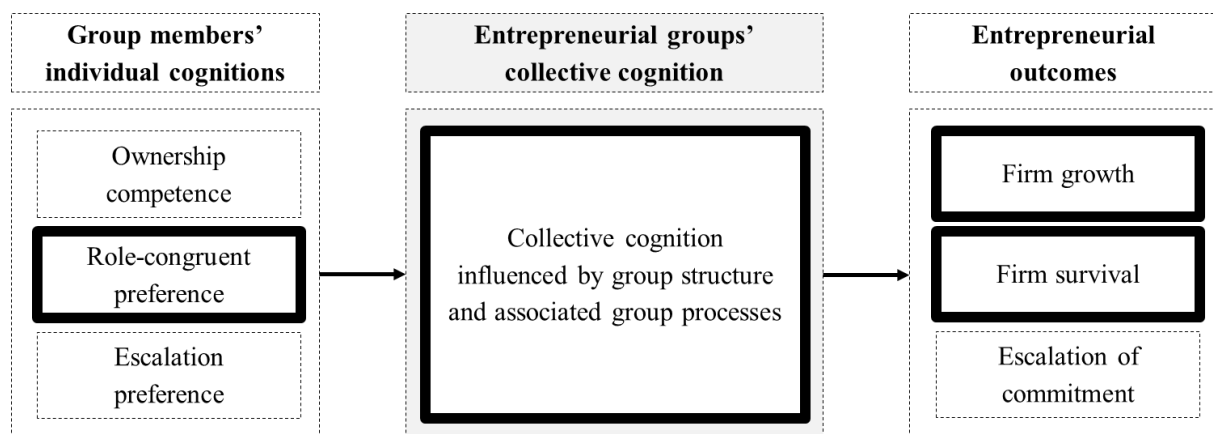
Figure 3. Key constructs in Chapter 3

1.2.3 Entrepreneurial groups' structure and escalation of commitment: The intersection of escalation of commitment and groupthink theory

Entrepreneurs are very likely to escalate their commitment to a failing venture because of the high costs associated with venture failure and their strong emotional attachment to the venture and its success (Kier et al., 2022; McCarthy, Schoorman, & Cooper, 1993; Shane, 2008). However, still little is known about the antecedents of entrepreneurs' escalation of commitment at the group level (Huang et al., 2019; Kier et al., 2022). Many examples of escalation of commitment in the group context point to an important role of groupthink (i.e., extreme concurrence seeking tendencies in groups, cf. Janis, 1972), which is associated with the suppression of critical thinking by individual members and the failure to reexamine alternatives to the chosen course of action (Keil & Mähring, 2010; Roberto, 2002). Groupthink can be induced by the structure of an entrepreneurial group (Janis, 1972; Lazar et al., 2020) and exacerbate the groups' response to an individual group member's preference for escalation (Whyte, 1993) or lead groups to collectively overestimate their abilities.

Two structural features of an entrepreneurial group that can be well linked to groupthink theory are *friendship ties* and *power distribution* within the group. Not only are these critical antecedents to groupthink, but also important research areas in the entrepreneurial group formation literature (see Lazar et al., 2020 for a recent review). The importance is rooted in the fact that groups are often formed based on friendship ties (Francis & Sandberg, 2000; Lazar et al., 2022; Ruef, Aldrich, & Carter, 2003) and in the fact that the distribution of power is an early and pivotal decision in the formation process (Certo, Covin, Daily, & Dalton, 2001; Ensley, Carland, & Carland, 2000; Grossman, Yli-Renko, & Janakiraman, 2012). Notably, previous research has established that both structural features are also associated with group processes (such as facilitated coordination) that may also hinder the emergence of the groups' escalation of commitment (Anderson & Brown, 2010; Francis & Sandberg, 2000). Accordingly, investigating the interplay between the group structure, groupthink (and other group processes),

and escalation of commitment in the setting of entrepreneurial groups is important and potentially yields important implications for scholars and practitioners alike.

Hence, I shed light on how an individual preference (escalation preference) in conjunction with a group's structure (i.e., friendship ties and power structure) shapes an entrepreneurial outcome (i.e., escalation of commitment); specified and formalized in the following research question (note that entrepreneurial groups are referred to as entrepreneurial teams to align with the more narrow focus of this research question): *How does the (1) relational structure and (2) power structure of an entrepreneurial team affect the team's escalation of commitment to a failing venture?* Figure 4 provides a simplified presentation of how this research question contributes to the overarching research objective of my dissertation.
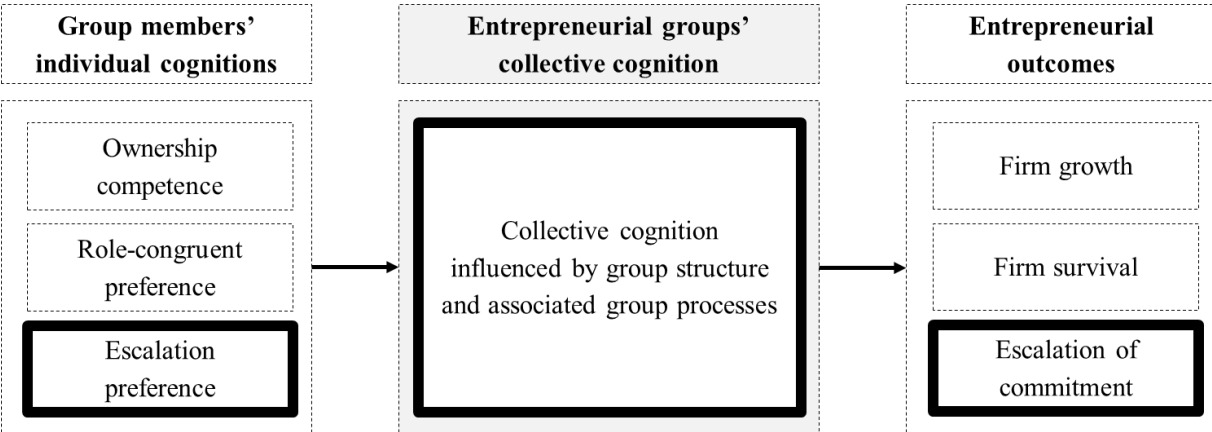
Figure 4. Key constructs in Chapter 4

1.3   Data and methods used in dissertation

I empirically investigate these three research questions in three dedicated chapters of the dissertation (Chapters 2-4) by relying on a variety of quantitative methods, including archival data, an online survey, and experiments. Chapter 2 (ownership competence) and Chapter 3 (gender composition) are based on archival data supplied by Bureau van Dijk's Orbis. I chose archival data for these two research questions because the investigated individual cognitions

(such as ownership competence) or proxies thereof (biological sex of owners) can be operationalized, while the hypothesized group mechanisms are well established in the literature. In Chapter 4 (escalation of commitment), I chose an experimental approach that allowed me to establish causality between the focal variables and measure proxies for the hypothesized group processes (Hsu, Mitchell, & Cao, 2024; Hsu, Simmons, & Wieland, 2017). I also relied on an experimental approach due to the inherent difficulty of measuring escalation of commitment using archival data (Gimeno et al., 1997; Sleesman, Conlon, McNamara, & Miles, 2012; Sleesman, Lennard, McNamara, & Conlon, 2018).

Specifically, in Chapter 2, I drew on a sample of German owner-managed firms for which I added detailed LinkedIn data on the firms' owners. The LinkedIn data served as critical addition to develop a measure of ownership competence. Since there is no precedent for measuring ownership competence, I also conducted a complementary survey with firm owners via the platform Prolific (Peer, Brandimarte, Samat, & Acquisti, 2017; Peer, Rothschild, Gordon, & Damer, 2022) to support the construct validity of the developed competence measure. In Chapter 3, I employed a large sample of Italian, Spanish, and French private firms (SMEs) with at least two owners. Chapter 4 includes a total of two face-to-face experiment with groups of entrepreneurship students, as well as two online experiments with "real" entrepreneurs (collected via the platform Prolific). Each of the three corresponding chapters contains detailed information on how data was collected.

1.4 Dissertation structure

The remainder of my dissertation is structured as follows. In Chapter 2, I discuss how the presence of family ties within a firm can constrain or facilitate the positive effect of an owner-managers' ownership competence on firm growth. This chapter is based on a research paper by von Nitzsch et al. (2024), which is forthcoming in the Strategic Entrepreneurship Journal. In Chapter 3, I investigate how the gender composition of an owner team influences the firm's

growth and survival, contingent on the size of the team. This chapter is based on a working paper by von Nitzsch and Bird (2024). In Chapter 4, I discuss how the structure of an entrepreneurial team constrains or facilitates the teams' escalation of commitment to a failing venture. This chapter is based on a working paper by von Nitzsch, Bird, Souitaris, and Shepherd (2024). In Chapter 5, I conclude the dissertation with a discussion of the key scholarly and practical implications of my dissertation, as well as an outlook with avenues of future research.

In Table 2, I provide a summary of the following three chapters of my dissertation, including information on the research questions, methods, sample, key findings, and contributions. I developed and conducted the research underlying each of these chapters under the guidance of co-authors; therefore, I use the pronoun "we" rather than "I" within these chapters. In addition, the term "entrepreneurial group" is specified to reflect the common designation in the main theoretical basis and the scope of each chapter (e.g., in Chapter 4, I refer to "the entrepreneurial group" as "the entrepreneurial team").

Table 2. Overview of dissertation chapters

Chapter	The strategic role of owners in firm growth: Contextualizing ownership competence in private firms	Ownership matters: Unveiling the gendered forces shaping firm growth and survival in private firms	Keep your (critical) thoughts to yourself: Entrepreneurial team's structure and the escalation of commitment to a failing venture
Motivation and research question	(1) How does ownership competence affect firm growth in private firms, and (2) what are the boundary conditions for the effect of ownership competence on firm growth?	How and under what conditions does an owner team's gender composition affect (1) firm growth and (2) firm survival?	How does the (1) relational structure and (2) power structure of an entrepreneurial team affect the team's escalation of commitment to a failing venture?
Theoretical framework	Strategic ownership literature (Foss et al., 2021); Penrosean growth theory (Penrose, 1959)	Strategic ownership literature (Foss et al., 2021); Social role theory (Eagly, 1987)	Escalation of commitment (Staw, 1981); Groupthink theory (Janis, 1972)
Method	Archival data; Online survey	Archival data	Experiments
Sample	Archival data: 2,509 German private firms (BvD Orbis) with matched LinkedIn data; Online survey (Prolific): 234 firm owners	Archival data: 42,673 European private firms (BvD Orbis)	Study 1 and 2 (Face-to-face): 32 and 37 Entrepreneurship student teams; Study 3 and 4 (Prolific): 235 and 237 real entrepreneurs
Key findings	Owners' experience-based competences are positively related to firm growth; relationships are weaker in family firms (only for governance competence) and older firms	Percentage of ownership shares held by women is associated with lower growth but higher survival; baseline relationships are more positive for larger teams	Friendship ties and unequal power structures in entrepreneurial teams cause teams' escalation of commitment; collective efficacy and task conflict respectively serve as mechanisms
(Main) Contributions	To the strategic ownership literature: Contextualizing the effect of ownership competence; first empirical operationalization and test of recently developed theoretical construct of ownership competence; To Penrosean growth theory: Specifying competences of firm owners required to grow the firm	To the strategic ownership literature: Introduction of gender differences within owner teams as important determinant of firm value creation; To literature on women entrepreneurship: Implications of women ownership is dependent on performance measure; complementarity of gendered behavior is dependent on team characteristics	To literature on entrepreneurial team formation: Escalation of commitment as dark side of certain structural features; To literature on entrepreneurial biases: Exacerbation of individual biases in the team depends on entrepreneurial teams' structure; To literature on group escalation: Groupthink may explain group escalation

2 The strategic role of owners in firm growth: Contextualizing ownership competence in private firms[2]

2.1 Introduction

Firm owners have the right to decide on their firms' resource allocation in alignment with their idiosyncratic theories of value (Schulze & Zellweger, 2021). Hence, their judgment[3] on how to deploy firm resources under Knightian uncertainty in the most efficient way constitutes an important antecedent for their firms' value creation (Foss et al., 2021; Foss & Klein, 2012, 2020). This argument lays the foundation for the emerging literature on strategic ownership (e.g., Felin & Zenger, 2017; Foss et al., 2021; Foss et al., 2023) and coincides with Penrosean growth theory (Penrose, 1952, 1955, 1959)—the most prominent theory of firm growth—in that it recognizes efficient resource deployment as a building block for firms' value creation and puts entrepreneurial judgment center stage. However, while Penrose (1959) emphasized the role firm decision-makers' *sound judgment* plays in firm growth, she did not elaborate on what underlies this sound judgment, such as the types of competences firm owners have (Foss et al., 2021). Thus, understanding how ownership competence underlies owners' sound judgment and how it translates into firm growth constitutes an important research gap.

The effect of ownership competence on firm growth is likely particularly salient in private firms, in which ownership is typically concentrated in a few individuals who are often managers of their firms (Foss et al., 2020; Schulze & Zellweger, 2021) and in which firm growth is a key indicator of value creation (Davidsson et al., 2017; Penrose, 1959). Accordingly, private firms provide an appropriate setting to study how and under what conditions ownership competence affects firm growth. Thus, in this chapter, we integrate conceptual work on

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[2] This chapter is based on a research paper that was accepted for publication at Strategic Entrepreneurship Journal (doi: 10.1002/sej.1497 © Wiley). The subchapters 2.1 to 2.6 are based on the indicated publication, with small adaptions to ensure consistency within the dissertation (see von Nitzsch, Bird, & Saiedi, 2024).
[3] Judgment is defined as the cognitive function of making decisions about the future when one cannot meaningfully use clear decision models and rules—for instance, when it is difficult to indefinitely assign probabilities to (desired) outcomes (cf. Foss, Klein, & Bjørnskov, 2019).

ownership competence (Foss et al., 2021; Foss et al., 2023) with Penrosean growth theory to answer the following research questions: *(1) How does ownership competence affect firm growth in private firms, and (2) what are the boundary conditions for the effect of ownership competence on firm growth?*

Exercising ownership competence refers to firm owners executing three competences (i.e., matching, governance, and timing competences) to create value for their firms (Foss et al., 2021). In this work, we examine the relationships between two of these competences—namely, matching competence and governance competence—and firm growth. These two distinct competences reflect owners' ability to theorize about the potential value of specific resource combinations (i.e., matching competence) and their ability to compose desired resource combinations through effective governance arrangements (i.e., governance competence).[4] Since these competences likely help owners structure firm resources and governance in a way that is conducive to growth, we contend that there are positive baseline relationships between owners' matching and governance competences and firm growth. Moreover, the strength of the relationship between ownership competence and firm growth is likely to depend on the organizational context (Foss et al., 2019; Foss et al., 2021). We therefore examine two boundary conditions of our baseline relationships: First, we investigate family firms as an organizational context characterized by owners' family embeddedness (Aldrich & Cliff, 2003), in which firms' inherent family ties can both enable and constrain the influence of owners' different competences on firm growth (Penrose, 1959). Second, we examine the role of firm age as a proxy for the degree of professionalization within a firm, which likely reduces firms' reliance on owners' competences (Foss et al., 2019; Foss & Klein, 2012; Schulze & Zellweger, 2021).

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[4] The third competence Foss, Klein, Lien, Zellweger, and Zenger (2021) introduced in their original work is labeled timing competence, which is "the skill to time investments into resources for maximized value creation" (Foss, Klein, Lien, Zellweger, & Zenger, 2021: 310). We do not focus on timing competence in our study due to inherent difficulties in empirically measuring it. Nevertheless, we provide some explorative evidence for the role of owners' timing competence in firm growth in Chapter 2.5.2.

To empirically test our hypotheses, we created a unique dataset of 2,509 private owner-managed firms in Germany for the period between 2011 and 2018 using data from Bureau van Dijk's Orbis. This database was matched with detailed LinkedIn data on each firm owner (i.e., the shareholder with the most shares) using large-scale data extraction, supplemented with hand-collected data. Our focus on owner-managed firms is rooted in the fact that owner-management makes the influence of owners' different competences on firm growth direct and measurable (Schulze & Zellweger, 2021; cf. Staw, 1991) and in the fact that owner-managers are particularly growth-oriented, seeming "more interested in the growth of their firm than they do in the income they withdraw from it" (Penrose, 1959: 25). We find evidence for our baseline hypotheses that owners' matching and governance competences (measured as experience-based competences [cf. Kor, 2003]) are positively associated with firm growth. Our results also suggest that the growth-inducing effect of owners' experience-based governance competence is weaker in family firms. Finally, our findings reveal that both experience-based competences matter more in younger firms compared with older firms.

This work offers three main contributions to the literatures on strategic ownership and Penrosean growth theory. First, we contribute to the strategic ownership literature (e.g., Felin & Zenger, 2017; Foss et al., 2021; Foss & Klein, 2020; Schulze & Zellweger, 2021) by examining boundary conditions (i.e., family firms and firm age) for the relationship between ownership competence and firm growth as an important facet of firms' value creation. Exploring these boundary conditions helps contextualize the theoretical relationship between ownership competence and firms' value creation. Second, as the first (to the best of our knowledge) to empirically operationalize ownership competence, we extend the strategic ownership literature—thus far dominated by conceptual work—with a novel approach that enables the empirical measurement of ownership competence. Finally, we contribute to the literature on Penrosean growth theory (Penrose, 1952, 1955, 1959) by elaborating on the

competences and boundary conditions thereof that enable firm decision-makers (notably firm owners) to exercise *sound judgment* to achieve firm growth.

2.2 Theoretical foundations

2.2.1 The strategic role of owners in value creation

The emerging literature on the strategic role of owners in firms' value creation builds on the notion that owners have residual control rights over firm resources, which gives them ultimate decision-making authority to allocate these resources in line with their idiosyncratic theories of value (Alchian, 1961; Alvarez et al., 2020; Foss et al., 2021; Schulze & Zellweger, 2021). Previous research has investigated how ownership form (Fitza & Tihanyi, 2017; Thomsen & Pedersen, 2000); heterogeneous owner interests (Connelly, Hoskisson, Tihanyi, & Certo, 2010; Lungeanu & Zajac, 2016; Ramaswamy, Li, & Veliyath, 2002); and owners' cognitive processes, such as their belief- and theory-formation and testing processes (Felin & Zenger, 2009, 2017; Zellweger & Zenger, 2023), are associated with different forms of value creation. The current literature mostly converges on the assumption that owners' *judgment* of how to access, invest, and allocate (scarce) resources under Knightian uncertainty becomes critical in the pursuit of firms' value creation (Foss et al., 2021; Foss & Klein, 2012, 2020). Overall, previous research has suggested that owners differ not only in their *theories of value* (Felin & Zenger, 2009; Zellweger & Zenger, 2023) but also in their competences (i.e., in the quality of their judgment) in composing and executing these theories (Foss et al., 2021; Foss & Klein, 2020).[5]

In their pioneering work on ownership competence, Foss et al. (2021) explicitly formulated the idea that firms' value creation depends on ownership competence, which refers to owners' skillful use of ownership as an instrument for value creation. Ownership competence

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[5] For example, the work of Felin and Zenger (2017) suggests that owners may be more or less competent in developing and refining the theories guiding their actions, and the work of Schulze and Zellweger (2021) implies that owners differ in their skills to set up a governance structure that addresses the control hazards associated with owner-management.

can be broken down into three subdimensions: matching competence ("what to own"), governance competence ("how to own"), and timing competence ("when to own") (Foss et al., 2021). Matching competence describes owners' ability to theorize about valuable resource configurations and cognitively envision a causal path to implement them, and governance competence denotes owners' ability to create effective governance arrangements that match their envisioned strategies (Foss et al., 2021). However, the importance of these competences for firms' value creation likely depends on the context (Boudreaux, Nikolaev, & Klein, 2019; Foss et al., 2019; Foss et al., 2021; Foss & Klein, 2012): For example, owners' family embeddedness (such as owners' family ties with other owners and managers in a firm), and the degree of professionalization of a firm's organizational structure (Schulze & Zellweger, 2021) may enable or constrain the exercise of owners' judgment with respect to certain strategic actions such as pursuing firm growth (Foss et al., 2021).

2.2.2 The role of judgment in Penrosean growth theory

In her seminal work, Penrose (1959: 21) argued that firms represent "a collection of productive resources, the disposal of which between different uses and over time is determined by administrative decision."[6] Penrose further explicated how the effective exploitation of unused resources is central to achieving firm growth and how firm growth depends on entrepreneurs' supply of *entrepreneurial services* to their firms. These entrepreneurial services include, for instance, developing and experimenting with novel ideas, implementing changes to the administrative structure of an organization, and acquiring new managerial resources (Penrose, 1959). As the supply of these services depends on entrepreneurs' idiosyncratic imagination, Penrose also recognized the role of entrepreneurial judgment in firm growth.

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[6] Penrose (1959: 22) continued by stating that "it is never resources themselves that are the 'inputs' in the product process, but only the services that the resources can render. The services yielded by resources are a function of the way in which they are used." Thus, this statement points to the fact that entrepreneurial judgment and competences about resource use matter for firms' value creation.

Specifically, Penrose (1959) emphasized that entrepreneurial judgment plays an important role in firm growth because entrepreneurs have to choose between different alternatives of how to allocate resources to achieve growth under uncertainty. One way for entrepreneurs to reduce uncertainty is to collect and evaluate information about the viability of different actions plans. They then need various competences to harness this information in their skillful judgment (Penrose, 1959). Penrose denoted *entrepreneurs* as "individuals or groups within the firm providing entrepreneurial services, whatever their position or occupational classification may be" (Penrose, 1959: 28). Thus, she implicitly and, at times, explicitly treated owners as providers of entrepreneurial services and the origin of authoritative communication highlighting owners' ultimate decision-making authority (Penrose, 1959: 18). The critical role of firm owners' judgment is particularly salient in Penrose's discussion of how owners of smaller firms exert significant influence on their firms' operations and strategies.[7] In this context, Penrose described owners as an important source of competences and skillful judgment that can spur firm growth, especially when ownership is concentrated.

2.3 Hypothesis development

In the following, we elaborate on how we operationalize ownership competence for this chapter and explain how we combine insights from Penrosean growth theory and the strategic ownership literature to hypothesize on *how and under what conditions* ownership competence influences firm growth. Owners' past experience should increase their competences (Kor, 2003; Lungeanu & Zajac, 2016; Penrose, 1959; Uygur & Kim, 2016). Past experience not only enhances individuals' ability to map situations to the outcomes of past decisions but also expands the range of carefully analyzed alternatives available due to the higher frequency of

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[7] For example, she stated, "[…] even if a firm is not very ambitious, it may nevertheless be competently managed. This is particularly true of those smaller firms where there is a close relation between the 'goals' of the owners and the 'goals' of firms" (Penrose, 1959: 41). On the flipside, she stated, "[…] firms that have grown large (according to any of the commonly accepted criteria of what is large) have reached a size where either the ownership equity is widely shared, or the owners' control of operations is in practice effectively limited by the managerial bureaucracy" (Penrose, 1959: 24).

similar past decisions individuals can refer to (Gigerenzer & Gaissmaier, 2011; Uygur & Kim, 2016).[8] Hence, in line with past work (e.g., Kor, 2003; Lungeanu & Zajac, 2016), in the following, we theorize about the role of owners' *experience-based* competences (i.e., experience-based matching and governance competences) in firm growth. We also investigate the role of two moderators pertaining to owners' family embeddedness in a firm (*i.e., family firms*) and to the degree of professionalization within a firm (*i.e., firm age*) (Thornhill & Amit, 2003) to understand how the organizational context shapes the exercise of owners' judgment.

2.3.1 Owners' experience-based matching competence and firm growth

Firm resources can be utilized, redeployed (Helfat & Eisenhardt, 2004), or recombined in different ways to create value (Felin, Kauffman, & Zenger, 2023), making the resource-allocation process dependent on firm decision-makers' imagination (Penrose, 1959). Put differently, resources themselves can be seen as "an epiphenomenon of the theories that animate them and value in resources is defined through the lens of unique theories, questions, and problems that reveal novel uses and functions" (Felin & Zenger, 2017: 259). Hence, owners' cognitive process of crafting and refining theories of value may be central to achieving firm growth.

We argue that owners with experience-based matching competence craft more refined initial theories about how best to deploy and combine resources to grow their firms and are also more adept at further refining their theories based on emerging insights derived from information search, market feedback, and experimentation with different resource combinations (Felin & Zenger, 2009, 2017; Foss et al., 2021; Foss & Klein, 2020; Zellweger & Zenger, 2023). Specifically, we argue that these owners' ability to develop more refined initial theories stems

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[8] Entrepreneurs who are also firm owners particularly rely on simplifying heuristics in decision-making (Busenitz & Barney, 1997). Individuals acquire heuristics from the idiosyncratic experience they have accumulated. Therefore, experience engenders more nuanced and appropriate heuristics and a broader pool of alternatives to draw upon for decision-making. For instance, Uygur and Kim (2016) showed that entrepreneurs' judgment becomes more selective (i.e., they have a better overview of and stronger confidence in their opinions of their ventures' success factors) with the accumulation of experience.

from their accumulated experiential knowledge, which allows them to rely on advanced heuristics in formulating and testing their idiosyncratic theories of how to allocate firm resources to achieve growth (Felin & Zenger, 2017; Zellweger & Zenger, 2023).

Moreover, we contend that owners with experience-based matching competence are equipped to adapt to the uncertainty that accompanies any expansion plan (cf. Penrose, 1959) by efficiently acquiring information that helps them reassess the viability of the chosen expansion path. This acquisition of novel information may be partly rooted in these owners' experimentation with alternative resource configurations (in this case, generating theories about alternative expansion paths, testing their efficacy, and choosing the most value-creating path) (Camuffo, Cordova, Gambardella, & Spina, 2020; Felin & Zenger, 2017; Koning, Hasan, & Chatterji, 2022; Zellweger & Zenger, 2023).

To summarize, owners' experience-based matching competence likely leads to a superior understanding of the potential value of specific resource combinations and likely helps owners *pick winners* (cf. Baum & Silverman, 2004) based on well-formulated and constantly refined theories (Felin & Zenger, 2017). When deciding what expansion path to pursue, owners' refined theories about efficient resource deployment likely positively affect firm growth. Therefore, we suggest a positive relationship between owners' experience-based matching competence and firm growth.

Hypothesis 1a. *Owners' experience-based matching competence is positively related to firm growth.*

2.3.2 Owners' experience-based governance competence and firm growth

Firm growth also necessitates revising the focal firm's administrative (and governance) structure (Penrose, 1959), which requires owners' governance competence. For example, owners have to exercise judgment about when to delegate authority to managers, how to distribute rents in a way that generates appropriate incentives for stakeholders, and how to foster stakeholders' firm-specific investments to diminish hold-up concerns (Foss et al., 2021).

While delegating authority to managers is important to effectively pursue expansion, owners may differ in their ability to ensure their intended plans for expansion are implemented despite ceding control to managers (Foss et al., 2021). Owners with experience-based governance competence likely have not only superior abilities to recruit and select the right managers but also the ability to craft control systems that align managers' incentives with their own goals (Foss et al., 2021; Schulze & Zellweger, 2021). This process of aligning incentives constitutes a delicate balancing act between professionalizing operations through governance mechanisms, such as financial compensation and monitoring (Schulze, Lubatkin, Dino, & Buchholtz, 2001; Schulze & Zellweger, 2021; Uhlaner et al., 2007), and ensuring that operations are not "handicapped by bureaucratic bottle-necks" (Penrose, 1959: 182). Thus, we suggest that owners with experience-based governance competence are more adept at addressing the control dilemma outlined by Wasserman (2017), which explains how owners who relinquish control can enhance firms' value creation (see also Schulze & Zellweger, 2021). In addition, owners with experience-based governance competence are likely equipped with superior skills to both formally and informally institutionalize relationships with important resource providers, such as suppliers (Foss et al., 2021). This management of key stakeholders also includes drafting contractual agreements with stakeholders when necessary to avoid hold-up and to secure reliable access to key resources needed for firm growth (Foss et al., 2021; Penrose, 1959).

Overall, we conclude that owners with experience-based governance competence likely have the skills to create a governance structure (that addresses the control vs. growth dilemma and the institutionalization of relationships with key stakeholders), which allows for the effective pursuit of their envisioned expansion path. Such a formalized and elaborate governance structure also likely increases the efficiency of firm operations, and the resulting efficiency gains, in turn, yield untapped resources that can be used to achieve firm growth (Morris, Allen, Schindehutte, & Avila, 2006; Penrose, 1959).

Hypothesis 1b. *Owners' experience-based governance competence is positively related to firm growth.*

2.3.3   The moderating effect of family ties

In exploring the boundary conditions of our baseline relationships, we add that family relationships within the firm can enable or constrain the relationship between owners' competences and firm growth. Family firms are unique because of their long-term horizons and aligned goals and preferences (Chrisman, Chua, Pearson, & Barnett, 2012), and family relationships within these firms are characterized by altruism (Schulze, Lubatkin, & Dino, 2002), reciprocity, and trust (Arregle, Hitt, Sirmon, & Very, 2007). We argue that these peculiarities of family firms strengthen the positive relationship between owners' experience-based matching competence and firm growth for two reasons.

First, family members frequently exchange information and other resources, such as financial, human, and social capital (Aldrich & Cliff, 2003; Habbershon, Williams, & MacMillan, 2003). This exchange is particularly important when owners pursue novel resource configurations because other family members can contribute important information that allows owners to efficiently refine their theories of value and can help them acquire the resources necessary to implement these theories. Penrose (1959) also pointed to the critical role of information gathering in reducing uncertainty about various factors that could affect an envisioned expansion plan. In family firms, family members tend to maintain close connections to stakeholders (e.g., customers and suppliers) who provide unique and timely access to information (Arregle et al., 2007), thereby facilitating such information gathering.

Second, Penrose (1959: 53) noted that firm decision-makers are more likely to take into account others' judgment if they trust and know them "and if they share a general responsibility for the outcome." Thus, because relationships in family firms are characterized by trust and mutual obligations (Arregle et al., 2007; Bird & Zellweger, 2018; Zellweger et al., 2019), owners may be more likely to take family members' judgment into account (Penrose, 1959).

Taken together, these arguments imply that in family firms (compared with nonfamily firms), owners' experience-based matching competence is strengthened by family members' judgment and resources, allowing owners to allocate resources more efficiently and in more novel ways to foster firm growth.

Hypothesis 2a. *The positive relationship between owners' experience-based matching competence and firm growth is stronger for family firms compared with nonfamily firms.*

However, family firms' unique characteristics also have implications for their governance structures (Mustakallio, Autio, & Zahra, 2002; Schulze et al., 2001; Schulze, Lubatkin, & Dino, 2003; Uhlaner et al., 2007) particularly because of how family roles are integrated with and imprinted on business activities (Tagiuri & Davis, 1996; Yang & Aldrich, 2014). For instance, family firms are prone to nepotism (e.g., Vinton, 1998) and tend to focus on persevering their socioemotional wealth (Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson, & Moyano-Fuentes, 2007), including their transgenerational control (Zellweger, Kellermanns, Chrisman, & Chua, 2012).

We argue that these characteristics inherent in family firms may impede them from implementing an effective governance structure that facilitates firm growth. Specifically, other family members might interfere with strategic plans to professionalize a family firm if it diminishes the family's control. For instance, nepotism might lead owners to favor family managers over (potentially more competent) nonfamily managers (Chen, Chittoor, & Vissa, 2021). Therefore, although owners with experience-based governance competence possess the general skills to create an organizational structure that favors firm growth (e.g., delegating authority to managers or enacting growth-enhancing rent-sharing and monitoring regimes), they might be less able—or willing—to institute an effective governance structure when family members are part of their firms (Foss et al., 2021; Neckebrouck, Schulze, & Zellweger, 2018). Family members' reduced willingness to take strategic actions that would entail reduced control over their firms is also echoed in Penrose's anecdotal discussion of family firms that refrain

from taking advantage of growth opportunities (Penrose, 1959). Taken together, these arguments suggest that family firms are less likely than nonfamily firms to benefit from owners' growth-inducing experience-based governance competence (Penrose, 1959).

> **Hypothesis 2b.** *The positive relationship between owners' experience-based governance competence and firm growth is weaker for family firms compared with nonfamily firms.*

2.3.4 The moderating effect of firm age

Moreover, we propose that firm age weakens the baseline relationship between owners' experience-based matching competence and firm growth. Specifically, during their founding years, firms face the liability of newness and have to establish a strong resource base in an uncertain environment (Stinchcombe, 1965) with a vast number of possible uses for these resources (Felin & Zenger, 2017; Foss & Klein, 2012). Thus, in young firms, which have only a limited amount of information available to evaluate (Bingham, Eisenhardt, & Furr, 2007) and limited institutional tacit knowledge to build on, owners have to experiment with resource configurations and "reallocate resources as information about the viability of each path emerges" (Schulze & Zellweger, 2021: 492). Matching skills are crucial in this period of "experimental resource allocation" (Sirmon, Hitt, Ireland, & Gilbert, 2011: 1401) as they allow owners to efficiently bundle and rebundle resources to pursue the most promising expansion route.

As firms mature, their core business stabilizes (Kaplan, Sensoy, & Strömberg, 2009), and the uncertainty surrounding them decreases (Stinchcombe, 1965). Specific resource combinations have already proven to be successful, and the intensity of experimentation needed is lower than in younger firms (e.g., Coad, Segarra, & Teruel, 2016). Also, individuals in older firms can draw on the firms' experiential learning and knowledge (e.g., Hashai & Zahra, 2022). Put differently, they are informed by previous experience with "what works and what does not" when it comes to allocating resources toward growth. In particular, Penrose highlighted the fact that older firms tend to focus on *related diversification* (i.e., pursuing expansion in similar

markets or with similar products as in previous expansions), implying that the amount of novelty and uncertainty accompanying expansions decreases with firm age. We thus expect that owners' experience-based matching competence will become less important over time.[9]

Hypothesis 3a. *The positive relationship between owners' experience-based matching competence and firm growth is weaker for older firms than it is for younger firms.*

As firms age, owners face pressure to professionalize them by implementing a more decentralized governance structure as well as reporting and monitoring systems. This pressure arises because owners' control efforts become increasingly costly as their firms get older (Gedajlovic, Lubatkin, & Schulze, 2004; Schulze & Zellweger, 2021). The professionalization of a firm is a gradual process that happens "as it moves from start-up to becoming more established" (Uhlaner et al., 2007: 233). Specifically, over time, more governance arrangements, such as formal control and reporting systems (Baron, Hannan, & Burton, 1999; Penrose, 1959; Uhlaner et al., 2007), are implemented. With these standardized processes in place, owners are more likely to delegate authority to subordinates, whose decisions "in their defined fields are rarely overruled" (Penrose, 1959: 46). When delegated such authority, over time, managers grow more experienced in handling the majority of business decisions themselves. Hence, as firms age, the range of situations considered nonroutine and requiring owners' competences narrows. Schulze and Zellweger (2021) also considered this phenonmenon, arguing that authority delegated to professional managers likely reduces firms' dependency on owners' judgment and decision-making. Accordingly, we posit that as firms age, owners' experience-based governance competence becomes less relevant for firm growth.

Hypothesis 3b. *The positive relationship between owners' experienced-based governance competence and firm growth is weaker for older firms than it is for younger firms.*

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[9] There remain nonroutine cases in which owners' experience-based matching competence may become important for certain activities in later stages, such as mergers and acquisitions. However, while requiring well-developed resource reconfigurations, such nonroutine activities are not prevalent among the private owner-managed firms in our sample (e.g., see Celikyurt, Sevilir, & Shivdasani, 2010; Maksimovic, Phillips, & Yang, 2013).

2.4 Research method

2.4.1 Data and sample

To test our hypotheses, we employed a sample of German private owner-managed firms (the majority of which are small and medium-sized enterprises) from the Bureau van Dijk's Orbis database for the period between 2011 and 2018. The Orbis database provides rich annual firm-level financial, ownership, and top management team data on private firms. We chose German firms because they offer particularly rich coverage of their financial and ownership data owing to regulatory filing requirements for private firms in Germany and because German owner-managed firms have been venerated as particularly growth oriented, resilient, and key to German economic growth (Audretsch & Lehmann, 2016; Berlemann, Jahn, & Lehmann, 2022; Pahnke & Welter, 2019). Further, we decided to focus on owner-managed firms for the following three reasons: First, in owner-managed firms, ownership is typically less dispersed. Owners have managerial discretion and firm-wide influence over their firms' resource deployment, making their influence more direct and measurable (Schulze & Zellweger, 2021; Staw, 1991). In particular, owner-managed firms typically profit from reduced agency costs (Jensen & Meckling, 1976) and decreased coordination and transaction costs because ownership is assigned to the person who also executes the theory of value (Schulze & Zellweger, 2021).[10] Second, owner-managers' explicit goal of growing their firms makes them an appropriate sample to measure the value-creating growth effects of ownership competence. Penrosean growth theory also highlighted this argument, contending that owner-managers prioritize growth over profit maximization—namely, that "owner-managers often seem to be more interested in the growth of their firm than they do in the income they withdraw from it" (Penrose, 1959: 25). Third, owner-management is the predominant form of ownership in private

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[10] In this vein, Staw (1991: 807) eloquently proposed that when individuals exert significant control over their organizations, "organizational action is a direct extension of individual behavior," such as their judgment-driven resource deployments.

firms worldwide, elevating the practical relevance of our study. For example, in Germany, about 88 percent of all firms are owner-managed firms (constituting the famous *German Mittelstand)* (Foundation for Family Businesses, 2023).

We used Orbis' historical databases to create an unbalanced panel that includes both active and inactive firms (i.e., firms that were dissolved during the period). This approach is closer to empirical reality as it does not restrict the sample to survivors only, thus diminishing survivorship bias (cf. Baum, Calabrese, & Silverman, 2000; Kumar & Zaheer, 2022). Similar to Belenzon, Patacconi, and Zarutskie (2016), we excluded firms when we could not identify who owned at least 90 percent of the ownership shares in any of the studied years. We also excluded firms whose largest shareholder was an institutional shareholder. To be able to build a panel with three consecutive values for growth rate, we only kept firms for which we had at least four consecutive years of data. After these steps, our sample comprised 57,939 firms, resulting in 225,657 firm-year observations.

Next, to test our hypotheses on the relationship between owners' experience-based competences and firm growth, we collected LinkedIn data on the shareholder with the greatest ownership stake in each firm (whom we will call *the owner* in the rest of the method section for the sake of brevity). For this purpose, we followed a dictionary-based text-extraction approach for those owners we could identify on LinkedIn (similar to Blohm, Antretter, Sirén, Grichnik, & Wincent, 2020). In particular, we extracted their work experience and formal education by combining manual coding with a bag-of-words approach (i.e., an approach that infers a specific construct from a list of words; for a detailed description, please see Chapter 8.1.2 in Appendix A) (Blohm et al., 2020). In doing so, we were able to derive distinct measures for owners' experience-based matching and governance competences as well as further control variables. Our final sample with data on all key variables consisted of 2,509 firms, resulting in 9,257 firm-year observations.

On average, the firms in the sample were 24.3 years old (SD = 24.7) and had 1.9 owners (SD = 1.2), 39.0 employees (SD = 145.8), and revenues of approximately €6.1 million (SD = 22.4). The largest shareholder owned 75.1 percent of the firm's shares (SD = 26.5) on average, and around 37 percent were family firms (following the conservative definition that a firm is considered a family firm when more than one family member of the firm owner is involved in either ownership or management [Miller, Le Breton-Miller, & Scholnick, 2008: 53]). Table A1 in Appendix A gives a detailed overview of the descriptive statistics for the firms' and owners' characteristics.

2.4.2 Measures

We measured our dependent and independent variables at time *t*, while balance-sheet control variables were lagged one year to avoid simultaneity bias.

Dependent variable. We measured *firm growth* as sales growth because this is the most commonly used growth indicator (Brush & Vanderwerf, 1992; Davidsson & Wiklund, 2006; Rauch, Frese, & Utsch, 2005) and since it has been argued to align "most closely to the logic of Penrose" (cf. Bradley, Wiklund, & Shepherd, 2011: 544). We calculated the yearly growth rate for each firm *i* at point *t* as the logarithmic difference in sales compared with the previous year. The natural logarithm corrects for the skewed distribution. The variable was computed as $g_{i,t} = ln$ [sales t] $- ln$ [sales $t - 1$], and we winsorized the values by 1 percent at each tail to reduce the impact of outliers. In the next step, based on the previous measure, we calculated the mean of sales growth on a two-digit NACE Rev 2 industry level for each year. In our main analysis, we used an industry-adjusted growth measure by subtracting the industry mean of sales growth from each firm's individual sales growth rate (Boeker, 1997).

Independent variables. Our two independent variables assessed the owners' experience-based matching and governance competences. We measured these variables as the owners' work experience relating to *matching* or *governance*, respectively, in months (cf.

Blohm et al., 2020). As described above, similar to Blohm et al. (2020), we used a bag-of-words approach to calculate both matching and governance experience as well as the owners' total work experience. Similar to other work that has derived constructs from computational linguistic analyses (Kanze, Conley, & Higgins, 2021; König, Mammen, Luger, Fehn, & Enders, 2018), we employed multiple steps to ensure construct validity. Most importantly, we employed a bottom-up procedure by deriving words related to matching and governance experience based on theoretical alignment and manually coded a random sample of 100 LinkedIn profiles out of the 2,509 firms used in the analysis a priori to collect commonly used keywords describing experience-based matching competence and governance competence. We further derived survey items aligned with our bag of words, distributed them to 234 firm owners using Prolific (Peer et al., 2017), and conducted an exploratory factor analysis to obtain evidence that we had captured experience-based matching competence and governance competence as two latent constructs (for more information, please see the Chapter 2.5.1; Chapter 8.1.2 in Appendix A; and Table A4 in Appendix A).

More precisely, to assess the owners' experience-based matching competence, we focused on all experience related to the process of resource allocations (e.g., experience in entrepreneurial endeavors or action verbs like *implement, test*, and *build*). Experience-based governance competence was measured as experience gained in positions involving team leadership and shaping corporate structures (keywords included *controlling*, *monitoring,* and *coaching* to further distinguish this experience from pure managerial experience). Further, we calculated the total months an owner had been active on the labor market up to the focal year (included as a control, see below). Finally, we calculated *experience-based matching competence* as the months of experience acquired in matching-related work divided by the total work experience in months and *experience-based governance competence* as the months of experience acquired in governance-related work divided by the total work experience in months

to effectively measure the intensity of matching- and governance-related experience in an owner's employment history.[11]

Moderating variables. In line with our arguments that an owner's judgment is influenced by their family members, we coded *family firm* as 1 if at least one member of an owner's family was involved in either management or ownership (Miller, Le Breton-Miller, and Scholnick, 2008) and 0 otherwise. Family relationships were determined by comparing the last names of all managers and other shareholders in a company to the last name of the owner. *Firm age* was measured as the number of years a firm had been in existence since its year of incorporation (Bird & Zellweger, 2018). As the distribution of firm age was skewed, we took the natural logarithm of firm age.

Control variables. We controlled for *firm size* as firm growth tends to decrease with firm size (Delmar, Davidsson, & Gartner, 2003; Sutton, 1997). We used the logarithm of the number of employees as a proxy for firm size. We further controlled for *leverage* to account for the financial health of a firm (George, 2005). We also introduced a quadratic term (*leverage^2*) to capture any nonlinearity in the effect of leverage on firm growth (as in Korteweg, 2010) and because the detrimental effect of higher leverage on firm growth is well documented (e.g., Giordani, Jacobson, Schedvin, & Villani, 2014). *Leverage* was calculated as the sum of current and noncurrent liabilities divided by total assets (Giordani et al., 2014). *Ownership concentration* was measured as the percentage of shares held by the focal owner (e.g., Schulze et al., 2003). Moreover, we controlled for *eponymy*, measured as a dummy variable equaling 1 if the focal owner's last name was reflected in the firm name and 0 otherwise (Belenzon, Chatterji, & Daley, 2017). Eponymy has been associated with increased reputational benefits and costs for firm owners in previous research (e.g., Belenzon et al., 2017, 2020). It may affect

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[11] Since we controlled for total work experience, this decomposition effectively isolates the effects of our experience-based competence measures from a mere mechanical effect of years of work experience on firm growth.

firm growth by serving as a positive signal for other stakeholders and may also alter owners'
growth aspirations (e.g., Wiklund & Shepherd, 2003). Finally, we controlled for the presence
of an *institutional shareholder*, calculated as a dummy variable equaling 1 if at least one of the
shareholders (excluding the focal owner) was an institutional shareholder and 0 otherwise.
Institutional shareholders frequently exert influence on the firms they are invested in to ensure
their goals are met and to provide them with valuable resources (Bushee, 1998; McCahery,
Sautner, & Starks, 2016). Hence, institutional shareholders may either complement or substitute
owners' competences. Finally, we controlled for *industry effects* by including industry dummy
variables based on the NACE Rev 2 (one-digit level) and year dummies to account for the panel
structure of our dataset.

We also controlled for variables on the owner level that we derived from LinkedIn.
Formal education might enhance firm growth by enabling owners to more effectively exploit
firm resources (Colombo & Grilli, 2005). We measured owners' education (again using a
similar bag-of-words approach) as a categorical variable equaling 0 if an owner received no
higher (university) education, 1 for a bachelor's degree, and 2 for a postgraduate education (i.e.,
master's, MBA, or PhD). This ordinal categorical variable was converted to indicator variables
for each level of higher education when entered into the empirical model specifications. We
controlled for owners' *network ties* given that access to and use of novel information available
through one's network is important for growth (Penrose, 1959). We measured network ties as
the natural logarithm of the number of an owner's LinkedIn contacts. Finally, we controlled for
owners' *total work experience*, measured in months, to isolate the effects of experience-based
matching competence and governance competence from total work experience (see above). We
took the natural logarithm of this variable to correct for its skewness.

Correction for selection biases. Further, we undertook steps to address the
survivorship bias that inherently occurs in studies on firm growth (e.g., Colombo & Grilli, 2005)
as well as the sample-selection bias arising from the fact that we only included firms for which

we could collect experience and education data for their owners via LinkedIn. First, while we employed an unbalanced panel to mitigate survivorship bias, selection concerns remain due to our restriction of the data to observations with three continuous values for growth rate.[12] To correct for this potential bias, we ran a two-stage Heckman model (Heckman, 1979) calculating a selection variable controlling for firms' exits based on a Cox proportional hazard model (Lee, 1983). We used all our control variables (except those derived from LinkedIn) and ran the analysis on the sample of firms we derived prior to our restrictions (i.e., 155,710 firms and 404,149 firm-year observations). The first stage of the Heckman correction can be found in Appendix A (Table A2). We included the computed selection parameter (*lambda*) in all regression models (e.g., Taylor & Greve, 2006).

Second, to correct for the potential sample-selection bias arising from our LinkedIn search, we again followed Heckman's (1979) two-step method. Following Malhotra, Reus, Zhu, and Roelofsen (2018), we compared the firms in our final sample (i.e., 2,509 firms with matched LinkedIn data) to all German firms (whose data we extracted between 2011 and 2018) representing the population of firms from which we carried out our LinkedIn search (> 50,000 firms). We created a dummy variable equaling 1 if a firm was included in both samples and 0 otherwise. Then, we ran a probit model on all firms using this dummy variable and included all our variables except those derived from LinkedIn. Finally, we estimated the probability of being selected for all observations in our sample based on the estimate from the probit model (Heckman, 1979).[13] We included this estimate (*Inverse Mills Ratio*) in all regressions. The first stage of the Heckman correction can be found in Appendix A (Table A3).

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[12] This requirement means that firms that did not survive beyond 2013 or those that survived for fewer than four years were excluded in sample construction.

[13] Following suggestions by Li and Prabhala (2008) for selection models, we did not use an exclusion criterion as the model is identified by nonlinearity.

2.4.3 Analytical procedures

To test our hypotheses, we used firm random-effects model regressions with clustered standard errors at the firm level. Our hypotheses pertained to differences across firms as opposed to how firms change behavior over time since ownership structures change slowly and infrequently for the vast majority of private firms (Ongsakul, Jiraporn, & Treepongkaruna, 2021). Owing to this inherent "stickiness" of ownership, the within-firm variation in the ownership competence variables is limited and predominantly stems from slow-moving changes in the owners' competences rather than ownership changes (owner changes only occurred in approximately 1 percent of the observations in our sample). Consequently, we had much smaller within-firm (vis-à-vis between-firm) variation in our competence measures. Benson and Davidson (2009: 573) asserted that this consequence of the very slow-changing nature of ownership "may mask an ownership effect on firm value when using a fixed effect model."[14]

2.4.4 Results

Table 3 presents the correlations for the variables used in our analysis. The variance inflation factor values are below 2, indicating that multicollinearity was not a concern in the dataset. Table 4 presents the results of the regressions. Model 1 includes all of our control and independent variables. Model 2 and Model 3 report the moderating effect of family firm and firm age, respectively, for both independent variables. We also present the full model including all interaction terms (i.e., Model 4).

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[14] In addition, given that there was some randomness regarding which Orbis owners we can match to LinkedIn, and which individuals have completed the education and work experience section of their LinkedIn profiles, we recognize that individuals in our sample were randomly selected and thus consider individual differences, captured by an intercept parameter, to be random rather than fixed, making random effects models the appropriate estimation strategy (Hill, Griffiths, & Lim, 2018).

Table 3. Correlations for the variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Industry-Adjusted Sales Growth	1.000															
(2) Employees (Log)	-0.050	1.000														
(3) Leverage	0.032	0.004	1.000													
(4) Leverage^2	0.025	-0.040	0.912	1.000												
(5) Formal Education	0.007	0.022	-0.051	-0.044	1.000											
(6) Total Work Experience (Log)	-0.050	0.067	-0.022	-0.022	-0.002	1.000										
(7) Network Ties (Log)	0.030	0.040	0.020	0.015	0.043	0.043	1.000									
(8) Ownership Concentration	-0.009	-0.121	0.005	0.016	-0.085	-0.027	-0.043	1.000								
(9) Eponymy (0/1)	-0.061	0.004	0.005	0.013	-0.054	-0.081	-0.046	0.236	1.000							
(10) Inst. Shareholder (0/1)	0.008	0.110	-0.010	-0.003	0.058	0.047	0.021	-0.211	-0.147	1.000						
(11) Lambda	0.033	-0.171	0.244	0.208	-0.032	-0.057	-0.001	0.079	-0.072	-0.032	1.000					
(12) Inverse Mills Ratio	-0.037	0.167	0.109	0.109	-0.048	-0.016	-0.059	-0.033	-0.208	0.031	-0.010	1.000				
(13) Family Firm (0/1)	-0.030	0.163	0.017	0.015	-0.008	-0.025	-0.017	-0.126	0.259	-0.053	-0.109	0.286	1.000			
(14) Firm Age (log)	-0.135	0.259	-0.066	-0.050	-0.001	0.134	-0.052	0.036	0.266	-0.028	-0.220	0.366	0.299	1.000		
(15) Exp.-Based Matching Comp.	0.027	0.004	-0.029	-0.020	0.077	0.006	-0.047	-0.004	-0.074	-0.025	-0.020	-0.015	-0.027	-0.002	1.000	
(16) Exp.-Based Governance Comp.	0.014	0.016	-0.011	-0.011	0.022	0.079	0.067	-0.012	-0.087	0.015	0.012	-0.003	-0.045	-0.051	-0.518	1.000

Table 4. Random-effects panel regressions for industry-adjusted sales growth

DV: Industry-Adjusted Sales Growth	(1)	(2)	(3)	(4)
Firm Size (t - 1)	-0.007+	-0.007+	-0.007+	-0.007+
	(0.004)	(0.004)	(0.004)	(0.004)
Leverage (t - 1)	0.042	0.043	0.041	0.041
	(0.062)	(0.062)	(0.062)	(0.062)
Leverage^2 (t - 1)	-0.014	-0.015	-0.014	-0.014
	(0.041)	(0.041)	(0.042)	(0.041)
Bachelor's Degree	0.004	0.004	0.003	0.003
	(0.012)	(0.012)	(0.012)	(0.012)
Postgraduate Degree	0.001	0.002	0.001	0.001
	(0.005)	(0.005)	(0.005)	(0.005)
Total Work Experience	-0.010**	-0.010**	-0.010**	-0.010**
	(0.003)	(0.003)	(0.003)	(0.003)
Network Ties	0.004**	0.004**	0.004**	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)
Ownership Concentration	0.007	0.007	0.007	0.007
	(0.018)	(0.018)	(0.018)	(0.018)
Eponymy (0/1)	0.002	0.006	0.001	0.002
	(0.114)	(0.114)	(0.114)	(0.114)
Institutional Shareholder (0/1)	0.004	0.004	0.004	0.004
	(0.025)	(0.025)	(0.025)	(0.025)
Lambda	-0.004	-0.004	-0.002	-0.002
	(0.028)	(0.028)	(0.028)	(0.028)
Inverse Mills Ratio	0.056	0.072	0.053	0.057
	(0.416)	(0.416)	(0.417)	(0.417)
Family Firm (0/1)	0.003	0.029	0.004	0.017
	(0.038)	(0.039)	(0.038)	(0.040)
Firm Age	-0.039	-0.040	-0.008	-0.011
	(0.041)	(0.041)	(0.042)	(0.042)
Industry Dummies	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES
Key Independent Variables				
H1a: Exp.-Based Matching Competence	0.036***	0.042**	0.138**	0.139**
	(0.010)	(0.014)	(0.048)	(0.048)
H1b: Exp.-Based Governance Competence	0.024*	0.045***	0.148***	0.143**
	(0.009)	(0.013)	(0.044)	(0.044)
Moderating Effects				
H2a: Matching x Family Firm		-0.011		0.005
		(0.019)		(0.020)
H2b: Governance x Family Firm		-0.051**		-0.034+
		(0.018)		(0.020)
H3a: Matching x Firm Age			-0.034*	-0.034*
			(0.015)	(0.015)
H3b: Governance x Firm Age			-0.042**	-0.035*
			(0.013)	(0.014)
Constant	-0.001	-0.043	-0.094	-0.099
	(0.755)	(0.755)	(0.759)	(0.757)
Observations	9,257	9,257	9,257	9,257
Number of Firms	2,509	2,509	2,509	2,509
R-Squared Overall	0.024	0.025	0.026	0.026
R-Squared Between	0.062	0.066	0.067	0.069
R-Squared Within	0.021	0.021	0.022	0.022

Note: The coefficients for the industry and year dummies are included but not reported. Standard errors are in parentheses (clustered at the firm level). Analyses with the logarithm of total assets as an alternative measure of firm size yield identical results. + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Model 1 offers strong support for our baseline hypotheses (Hypotheses 1a and 1b). Both owners' experience-based matching competence ($\beta = 0.036$, $p < .001$) and governance competence ($\beta = 0.024$, $p < .05$) are positively related to firm growth. These results signify that a change of one standard deviation in owners' experience-based matching competence and governance competence equals a 1 percent and 0.7 percent change in annual sales growth, respectively. As these are annual figures, they will compound to make a large difference in sales growth over time. To exemplify, after 18 years (i.e., the median age of the firms in our sample), a change of one standard deviation in owners' experience-based matching competence would represent 19.6 percent growth in total sales.

Model 2 reports the results for Hypotheses 2a and 2b. We did not find support for Hypothesis 2a, which proposed that the relationship between owners' experience-based matching competence and firm growth is reinforced in the case of family firms ($\beta = -0.011$, $p > .10$). However, we found support for Hypothesis 2b, which proposed that the effect of owners' experience-based governance competence on firm growth is weakened in family firms ($\beta = -0.051$, $p < .01$). That means that holding all other variables constant, an increase of one standard deviation in owners' experience-based governance competence leads to 1.4 percent lower firm growth in family firms compared to nonfamily firms.

Model 3 shows the results for Hypotheses 3a and 3b. As expected, we found that firm age weakens the relationship between owners' experience-based matching competence and firm growth ($\beta = -0.034$, $p < .05$) and the relationship between owners' experience-based governance competence and firm growth ($\beta = -0.042$, $p < .01$). These coefficients imply that a change in firm age from the 10th percentile (7 years) to the 90th percentile (49 years) corresponds to a 56 percent (55%) decrease in the effect of owners' experience-based governance (matching) competence on firm growth when holding owners' experience-based governance (matching) competence constant at its mean. All interaction terms remained statistically significant when put into one model (i.e., Model 4).

2.5 Additional analyses

2.5.1 Construct validity for the experience-based matching and governance competence measures

To check the construct validity of our measures for experience-based matching competence and governance competence, we transformed a selection of words from our bag of words into survey items, distributed them to a sample of firm owners in a questionnaire, and then carried out an exploratory factor analysis. We assumed that our observed variables (i.e., the occurrence of words in owners' LinkedIn profiles) are associated with two latent variables that we labeled as experience-based matching competence and governance competence, respectively. Given that both constructs are relatively new to the literature, this additional analysis serves as an objective verification of our bag-of-words approach. It further helps clarify the nuances of experience-based matching competence and governance competence and offers an opportunity to enhance the discriminant validity between these measures.

Specifically, we created 24 items related to matching and governance skills (see Table 5 for all items and Table A4 in Appendix A for information on their development). We sent a questionnaire consisting of these items to 234 firm owners[15] using Prolific, a crowdsourcing platform for behavioral research that is known for its high-quality data generation (Peer et al., 2017). The 24 items asked participants to indicate their experience with specific activities in a firm related to either matching or governance on a seven-point Likert scale (see Table 5).

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[15] After excluding participants who took suspiciously little time, failed attention checks, or did not complete the whole survey, we used answers from 170 firm owners for our analyses. Overall, 47% of the participants were women. On average, they were 45.01 years old (SD = 12.28) and had an average of 83.92 (SD = 97.82) months of entrepreneurial experience and 77.41 (SD = 110.60) months of leadership experience.

Table 5. Exploratory factor analysis for experience-based matching competence and governance competence

C	Items	Factor 1	Factor 2
M	I am experienced in searching for alternative uses for the firm's resources.	**0.63**	0.25
M	I am experienced in implementing new solutions to increase the firm's efficiency.	**0.68**	0.23
M	I am experienced in founding new ventures.	**0.58**	0.15
M	I am experienced in assembling the firm's resources to pursue innovative ideas.	**0.82**	0.26
M	I am experienced in integrating new resources into the firm's existing resource base.	**0.73**	0.28
M	I am experienced in optimizing the firm's efficiency and effectiveness by configuring resources in a novel way.	**0.64**	0.24
M	I am experienced in developing new products or services out of the firm's existing resource base.	**0.72**	0.23
M	I am experienced in finding creative solutions to address the firm's challenges.	**0.70**	0.19
M	I am experienced in transforming existing resource bundles to a new use to create value for the firm.	**0.76**	0.30
M	I am experienced in conducting thought experiments and testing alternative resource configurations to determine their potential value.	**0.54**	0.24
M	I am experienced in launching new products or services.	**0.64**	0.10
M	I am experienced in conceptualizing new opportunities for value creation.	**0.65**	0.14
M	I am experienced in developing strategies to strengthen the firms' future value creation.	**0.73**	0.34
M	I am experienced in collaborating with stakeholders to create new opportunities for the firm.	0.27	**0.61**
M	I am experienced in recruiting managers that complement the firm's resource base well (e.g., in terms of knowledge or other capabilities).	0.30	**0.71**
G/ M	I am experienced in coordinating activities (e.g., decomposing tasks into subtasks or budgeting) within the firm that contribute to achieve the firm's overarching goal.	**0.40**	**0.50**
G	I am experienced in managing other people (e.g., employees).	0.11	**0.86**
G	I am experienced in crafting incentives for the firm's employees that help to align their interests with those of the firm.	0.31	**0.73**
G	I am experienced in introducing control-mechanisms to ensure that the firm's goals are fulfilled.	**0.56**	**0.49**
G	I am experienced in monitoring employees (e.g., using budgeting and reporting systems) to increase the efficiency of the firm.	0.27	**0.74**
G	I am experienced in coaching employees on how to employ their talents to contribute to the envisioned organizational strategy.	0.26	**0.84**
G	I am experienced in advising employees on how to contribute to the firm's overarching goals.	0.25	**0.86**
G	I am experienced in supervising employees to increase the firm's efficiency (e.g., when delegating key tasks).	0.15	**0.88**
G	I am experienced in delegating day-to-day decisions to employees.	0.08	**0.90**
Eigenvalue		11.03	2.94
Variance Explained by Each Factor (with Other Factors Controlled)		0.68	0.18
Cronbach's Alpha		0.93	0.94

Note: The first column represents the intended latent constructs (i.e., "M" = matching and "G" = governance). Factor 1 is related to the bag of words used to capture experience-based matching competence. Factor 2 is related to the bag of words used to capture experience-based governance competence. Factor loadings > .40 are in bold. Alpha coefficients are based on the a priori intended latent constructs (marked with grey shading).

In an exploratory factor analysis (Preacher & MacCallum, 2003), we identified two factors with eigenvalues greater than 1, so we followed Kaiser (1960) and restricted the analysis to two factors. In our subsequent analysis, we employed a varimax rotation to determine factor loading on two interpretable factors (i.e., experience-based matching competence and governance competence) (Kaiser, 1958). The results are given in Table 5. Taken together, both factors explained 86 percent of the variance of all items. Most of our items had factor loadings larger than .40 (which can be interpreted as a solid cut-off point [Stevens, 2012]) on the intended construct. We finally checked the reliability of scales consisting of all the items that were supposed to load on the respective constructs and found sufficiently high Cronbach's alphas for both measures ($\alpha \geq .93$ for both). These results indicated that the bag of words we employed satisfactorily captured owners' distinct competences in matching and governance.

2.5.2 Construction of the measure for experience-based timing competence

In our theorizing and empirical analysis, we did not focus on (experience-based) timing competence—the third dimension of the ownership competence construct introduced by Foss et al. (2021). The main reason we excluded this dimension was that it is exceptionally hard to infer timing competence from owners' LinkedIn profile descriptions because users do not report the timing of their decisions. We also note that a general lack of data on the precise timing of private firm owners' investments or divestments also complicates the inference of owners' timing skills from financial, ownership, or other secondary data sources and that ownership transfers and major observable activities, such as mergers and acquisitions, are less common compared with public firms (Celikyurt et al., 2010; Maksimovic et al., 2013). Also, even with greater information on owners' decisions, it would be extremely challenging to reliably attribute the fortuitous timing of any individual owner's actions to luck or skill.[16]

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[16] See Harvey and Liu (2022) for a discussion on the requirement for at least 12 observations per unit of analysis (investors), using the most suitable method, to distinguish skill from luck.

Meanwhile, we assume that the timing aspect of competence is partly captured by our measure of experience-based matching competence (e.g., owners with experienced-based matching competence are better at determining when to acquire critical resources). Nevertheless, we derived a separate measure of experience-based timing competence in line with the procedure described above and included it in our regressions (e.g., we included action verbs like *exit* and *entry* in the corresponding bag of words). We show the bag of words and the output of the regression (see Table A5) in Appendix A. We did not find significant results for this measure of timing competence; however, the coefficient of our other two competence measures remained statistically significant, suggesting that the other ownership competence measures retain explanatory power and their effects are not minimized in significance, or subsumed, by the inclusion of timing competence.

2.5.3 Robustness tests

We further ran multiple robustness tests to confirm the reliability of our results. First, we reran our analysis with two alternative dependent variables. Specifically, we used the logarithm of sales growth (not adjusted by the industry mean of sales growth) as the dependent variable in our model, and the results remained qualitatively identical. We also employed an *industry-adjusted ratio of sales to employees* (Walter, Auer, & Ritter, 2006) to more generally assess firms' capacity to create value, verifying that the positive effect of ownership competence on growth extends to other measures of *value creation*. Owners' experience-based matching competence and governance competence are both positively related to this ratio (see Table A6 in Appendix A).

Second, we excluded firms for which we could not definitively identify a single individual as the largest shareholder (i.e., mostly cases in which the two or three largest shareholders held exactly the same number of shares). The results remained very similar (see Table A7 in Appendix A). We further excluded firms in which the largest shareholder held less

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than 25 percent of the shares, and again, the results remained similar (see Table A8 in Appendix A).

Third, we further investigated the relationship between both competence measures and firm growth for two separate subsamples of younger and older firms. Specifically, we repeated the main analysis (Model 1) in the lower- and upper-quartile subsamples of the values for firm age (firm ages equal to or less than p(25) = 10 and firm ages equal to or higher than p(75) = 28), respectively (see Table A9 and Table A10 in Appendix A). We found an increase in coefficients in our main effects for firms younger than 11 years ($N = 799$) but a drop in coefficients (indistinguishable from zero) for firms in the upper quartile indicating firms older than 27 years ($N = 712$).[17] This test enabled us to ensure that the effects of owners' experience-based matching competence and governance competence on firm growth are strongest in young firms. We also confirmed that the growth effect of owners' experience-based governance competence is weakened in family firms for the subsample of younger firms (see Table A10 in Appendix A), implying that family influence is already strong in young organizations.

Finally, we additionally controlled for owners' total number of managerial positions (up to the respective year) to mitigate concerns that owners' managerial competence drives our effects, effectively controlling for and teasing out the portion of ownership competence effect driven by owners' managerial experience. We observed similar results as in our main analysis (see Table A11 in Appendix A).

2.6 Discussion

This research integrated insights from the emerging literature on the strategic role of ownership in firms' value creation—particularly that of ownership competence (Foss et al., 2021)—with

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[17] Coefficients for the competence measures when firm age $\leq p(25)$: main effect of owners' experience-based matching competence ($\beta = 0.086$, $p < .001$), main effect of experience-based governance competence ($\beta = 0.074$, p < .01). Coefficients for the competence measures when firm age $\geq p(75)$: main effect of owners' experience-based matching competence ($\beta = 0.006$, $p > .10$), main effect of owners' experience-based governance competence ($\beta = -0.006$, $p > .10$).

Penrosean growth theory (Penrose, 1959) to empirically investigate the theoretical question of how and under what conditions ownership competence affects firm growth. Our empirical findings suggest a positive relationship between two ownership competences—owners' experience-based matching competence and governance competence—and firm growth in private firms; however, the magnitude of these effects depends on the organizational context. Namely, we found evidence that in family firms, the positive growth effect of owners' experience-based governance competence is weakened, while the relationship between experience-based matching competence and firm growth appears to be unaffected. Furthermore, we found that owners' experience-based competences are more strongly related to firm growth in younger firms than in older firms. Our work makes several important contributions to the strategic ownership literature and to Penrosean growth theory.

2.6.1 Implications for research

Our first major contribution is that our study sheds light on how the relationship between ownership competence and firms' value creation depends on the organizational context. Prior studies have provided strong theoretical arguments on how owners' judgment (Foss & Klein, 2012, 2020), owners' competences (Foss et al., 2021), and owners' abilities to form and test theories about resource configurations (Felin & Zenger, 2009, 2017; Zellweger & Zenger, 2023) enhance firms' value creation. However, while prior work has exemplified potential *boundary conditions* for the relationships between owners' competences and firms' value creation (Foss et al., 2019; Foss et al., 2021; Foss et al., 2023), so far they have not examined these contextual factors in depth. Accordingly, our study had the stated goal of deepening knowledge on the *contextualized* relationship between ownership competence and firms' value creation.

Counterintuitively, our findings did not confirm that the positive relationship between owners' experience-based matching competence and firm growth is strengthened in family

firms. We explain this finding by suggesting that the reinforcing effect of family members providing critical resources (that enable owners' experience-based matching competence) is potentially offset by the mitigating effect of family members blocking the exploration of novel (and thus inherently risky) resource configurations that may threaten firms' socioemotional wealth (Gómez-Mejía et al., 2007). Our results suggest that in family firms, family dynamics that undermine owners' experience-based matching competence may be at play. These mechanisms imply that family firms may not be able to fully leverage their unique bundle of resources in conjunction with owners' experience-based matching competence, representing an important and informative extension of the research on ownership competence (Foss et al., 2021; Foss et al., 2023). Further, our finding that the positive growth effect of owners' experience-based governance competence is weakened in family firms sheds light on the specific governance mechanisms at play in family firms and highlights that family firms do face issues in professionalizing their organizations even if owners' governance competence is high (Foss et al., 2021; Neckebrouck et al., 2018).

Our findings with respect to firm age also extend previous claims that older firms can draw on their own internalized experiential learning and knowledge, resulting in owners' experience-based matching competence and governance competence becoming less critical for firms' value creation over time (Beckman & Burton, 2008; Grant, 1996; Hashai & Zahra, 2022). We add to research on the "owner effect" in private firms (cf. Fitza & Tihanyi, 2017) by suggesting that once resources are *competently configured* and owners delegate authority to managers and establish governance mechanisms that ensure their envisioned theories of value are pursued, owners' governance and matching skills become less consequential for firm growth. Specifically, we show that the "owner effect"—or ownership competence effect—on firm-level outcomes is especially pronounced when firms are younger (Bryant, 2014; Simsek, Fox, & Heavey, 2015), which also supports arguments of the path dependency of firms' (initial) resource deployments (Felin et al., 2023).

Our second contribution is that we laid the groundwork for empirically measuring ownership competence. Research on the strategic role of owners and the impact of owners' unique characteristics and competences on value creation is just beginning to emerge and has mostly been conceptual in nature so far (e.g., Foss et al., 2021; Schulze & Zellweger, 2021; Zellweger & Zenger, 2023). Thus, understanding how to navigate the inherent difficulties of measuring ownership competence is critical for advancing knowledge in this burgeoning research area. Our unique bag-of-words approach, in conjunction with our survey-based construct-validity test (to operationalize ownership competence), provides a novel methodological framework for researchers to build on. Given that we made efforts to ensure the discriminate validity of our measures via an exploratory factor analysis, future researchers could rely on our survey items to conduct further empirical research on owners' matching and governance competences.

Further, by situating our empirical context in private firms, for which data is generally scarce, we respond to calls cautioning that attempts "to generalize findings about the determinants of public firm performance to other populations such as private firms may lead to erroneous conclusions." (Fitza & Tihanyi, 2017: 2727) and generate knowledge on this highly predominant organizational form. For private firms, firm growth is an important facet of value creation. We thus chose firm growth as our focal variable of interest and empirically tested our hypotheses on a construct that is of high relevance for private firms, practitioners, and researchers alike.

Third, we contribute to the literature on firm growth—and explicitly to Penrosean growth theory (Penrose, 1952, 1955, 1959)—by investigating what types of competences residing within firm decision-makers (i.e., firm owners in our setting of private firms) play a role in firm growth. Specifically, Penrose (1959) elaborated on how growth depends on the entrepreneurial services, such as changes to a firm's administrative organization or the development of novel ideas, provided to firms by entrepreneurs. While she recognized the importance of judgment in directing these services, she did not elaborate on the broad

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heterogeneity in the *quality of judgment* among firms' entrepreneurs (i.e., she primarily argued about the importance of entrepreneurs' "sound judgment"). Against this background, Penrose and scholars in the Penrosean tradition (e.g., Lockett et al., 2011) have typically not elaborated on the specific competences residing in firms' upper echelons (for an exception see Kor, 2003). We extend this literature by highlighting the role of two competences of firm owners—matching competence and governance competence—that can be well mapped to the different types of entrepreneurial services described by Penrose (1959).

Additionally, while researchers following the Penrosean tradition have explored the role of top management teams' competences in firm growth (Kor, 2003), we are the first to examine the competences of firm owners, who constitute firms' *ultimate decision-makers* (Alchian, 1961). The Penrosean logic of how firms grow applies to firm owners in particular because the ultimate decision-making authority of owners allows them to direct their firms' most important resources—namely, their human resources—in an efficient manner (Schulze & Zellweger, 2021). Hence, with our research, we set further anchor points on how Penrose's famous ideas of firm growth can be utilized in management and entrepreneurship research.

2.6.2 Limitations and avenues for future research

Our research has certain limitations that offer fruitful avenues for future research. First, empirically, we focused on owner-managers because in owner-managed firms, the effects of owners' competences are direct and measurable (Staw, 1991), thus making these effects less diluted by non-owning managers' characteristics (which we are not able to empirically measure within the same firm). However, future research should seek to better understand how the competences of non-managing owners, in conjunction with the competences of external managers, affect firms' value creation. We also note that our data-collection efforts were influenced by the availability of LinkedIn profiles for the owner-managers in our sample. Although we proactively addressed the potentially resulting selection bias by including a

corresponding selection parameter in all regressions, future research could repeat our analyses in different countries where LinkedIn is more widely used (vis-à-vis in Germany).

Another limitation could be that LinkedIn users may potentially omit relevant information or inflate their own accomplishments. While inferring experience from LinkedIn is a well-established approach in entrepreneurship and strategy research (e.g., Blohm et al., 2020), it is sensitive to the choice of information volunteered, which introduces a potential bias. We addressed this concern by triangulating LinkedIn information with other sources, such as Google searches, and were able to validate the reliability of firm positions for 100 randomly selected cases. Still, future research may find additional ways to extend and corroborate the LinkedIn data with additional data sources.

Finally, we solely focused on the largest shareholders. On average, the largest shareholder held around 75 percent of their firm's shares (see Table A1 in Appendix A for details on the distribution), indicating that our approach was viable. However, given the impossibility of identifying all private shareholders for all firms on LinkedIn, we could not calculate average competences across shareholders, again offering a fruitful avenue for future research.

2.7   Reflection and transition to Chapter 3

In Chapter 2, I presented a novel explanation of why firms grow by examining owners' experience-based matching and governance competence. However, these baseline relationships are subject to boundary conditions rooted in the organizational context of the firm; for example, the growth-enhancing effect of owners' experience-based governance competence is mitigated in family firms. This finding highlights that the context of the entrepreneurial group influences how individual cognitions (especially the cognitions of the most important group member—the owner-manager) affect entrepreneurial outcomes, such as firm growth. While this chapter focused primarily on the cognitions (the competence) of the owner-manager as the *primary*

principal of the firm, the following chapter elaborates on how the cognitions of multiple owners (in terms of their preferences) jointly influence entrepreneurial outcomes. Specifically, in Chapter 3, I focus on two entrepreneurial outcomes—growth and survival—that can both be conceptually linked to individual owners' role-congruent preferences and gendered behaviors.

3 Ownership matters: Unveiling the gendered roles shaping firm growth and survival in private firms[18]

3.1 Introduction

An extensive body of research argues that men and women differ substantially in their *overconfidence* and *social proclivities*—differences that are robust across organizational tasks and business contexts (Croson & Gneezy, 2009; Eagly et al., 2003). These gender[19] differences may explain the *rise and fall* of highly confident men business owners, such as Gorilla founder Kagan Sumer, who prioritized rapid growth over the sustainable development of the firm's operations (Camerer & Lovallo, 1999; Partington & Pratty, 2022),[20] as well as examples of women business owners who place more emphasis on sustainable business growth and non-financial goals (Guzman et al., 2020; Liao, Zhang, Wang, Bottom, Deichmann, & Tang, 2023). As emphasized in the burgeoning literature on the strategic role of ownership, firm owners have full authority to align their firms' resource allocation with their idiosyncratic preferences and judgment (Foss et al., 2021; Foss & Klein, 2020), suggesting a strong link between the "gendered" preferences (and consequently behavior) of firm owners and measurable firm-level outcomes, such as firm growth and survival (Staw, 1991), in line with the examples introduced above.

Examining the consequences of these gender differences is particularly interesting in the context of *owner teams* because men and women co-owners likely assume different roles in decision-making about their firms' resource allocation (Tang et al., 2021). Also, their interactions with co-owners and other stakeholders are likely shaped by their assumed gender

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[18] This chapter is based on a working paper by von Nitzsch and Bird (2024). An earlier version of this working paper was accepted for presentation at the Annual Meeting of the Academy of Management 2023 in Boston.

[19] Consistent with previous research, we infer owners' gender from their sex assigned at birth regardless of whether they identify as female, male, or non-binary. Thus, we assume that women are more likely to act in accordance with societal expectations associated with the female gender.

[20] In this example, the founder's excessive confidence gave him access to substantial amounts of funding that were used to aggressively expand the firm's operations. This aggressive expansion resulted in a forced and unsuccessful sale of the company to a competitor to avoid bankruptcy.

roles (Liao et al., 2023; Post et al., 2022). Specifically, social role theory posits that gender roles strongly influence individuals' behavior, suggesting a more *communal* orientation for women and a more *agentic* orientation for men (Eagly, 1987; Eagly et al., 2003). Previous research on top management teams and CEOs has shown that women's communal orientation contributes to firms' strategic change (Post et al., 2022; Tang et al., 2021) and the realization of new business opportunities (Lyngsie & Foss, 2017), while men's agentic orientation contributes to firm-level risk-taking (Chen et al., 2019; Huang & Kisgen, 2013) and firm performance (Burkhard, Sirén, van Essen, Grichnik, & Shepherd, 2023). However, there is scant research on how owners' gendered behavior influences firm-level outcomes in private firms. In private firms, a limited number of men and/or women owners have full decision-making authority to allocate firm resources in alignment with their idiosyncratic beliefs. Thus, a better understanding of their judgment about how to deploy those resources should help explain the substantial heterogeneity in private firms' growth and survival (Brüderl et al., 1992; Penrose, 1959; Schulze & Zellweger, 2021).

Firm growth and survival are especially interesting outcomes to investigate at the intersection of the strategic ownership literature and social role theory because men owners are argued to place more emphasis on firm growth compared to survival (and vice versa for women) (Watson & Robinson, 2003); because both outcomes are intertwined in a complex manner such that, for example, excessive firm growth may decrease the likelihood of firm survival (Delmar et al., 2013); and because finding the delicate balance between both may crystallize as a superior strategy for private firms to sustain their operations over the years (Brüderl & Schüssler, 1990; Delmar et al., 2003; Gimeno et al., 1997). Thus, we pose the following research question: *How and under what conditions does an owner team's gender composition affect (a) firm growth and (b) firm survival?*

Extant empirical evidence shows that women's influence on firm-level decision-making (especially because of their social proclivities) can reduce polarization toward risk (Chen et al.,

2019; Kaplan, 2008), promote critical deliberation (Chen et al., 2019; Farh et al., 2020; Post et al., 2022), foster a safe environment (Lyngsie & Foss, 2017; Tang et al., 2021), and limit the impact of men's *agentic* "action-first" orientation on firm decision-making (cf. Farh et al., 2020). We argue that in the context of *owner teams*, similar processes are likely to depend on the percentage of ownership shares held by women. Specifically, we suggest that a higher percentage of ownership shares held by women results in the less aggressive pursuit of risk-entailing strategies (Hayward et al., 2006; Malmendier & Tate, 2008), which we propose relates positively to firm survival but negatively to firm growth (cf. Burkhard et al., 2023).

We also contend that these theoretical relationships are subject to boundary conditions rooted in team characteristics (West III, 2007). Foremost, the number of co-owners likely moderates these relationships because the social proclivities of women are likely more effective in larger teams than in smaller teams (Tang et al., 2021). This effectiveness is rooted in the fact that in larger teams, it becomes more difficult to leverage the perspectives of each owner to promote firm growth and survival (Amason & Sapienza, 1997; Huber, Sloof, van Praag, & Parker, 2020). Thus, we theorize that as the number of co-owners increases, the relationships between the percentage of ownership shares held by women and both firm growth and survival become more positive.

To test our assumptions, we used a longitudinal sample of 42,673 Italian, French, and Spanish small and medium-sized private firms owned by at least two owners and with a maximum age of 20 years (Bird & Zellweger, 2018) extracted from Bureau van Dijk's Orbis database. We focused on *owner teams* in private firms because owners in such firms are primarily responsible for resource allocation (Knight et al., 2020) and have a direct influence on their firms' strategic decisions (Klotz et al., 2014; Staw, 1991). Our analyses provide support for our hypotheses. Interestingly, subsequent analyses reveal that for larger teams (with six or more owners), the percentage of ownership shares held by women is no longer associated with a growth disadvantage but is still associated with a survival advantage. This finding points to

the complementarity of the diverse behavioral tendencies of women and men that emerges in larger teams (see also Tang et al., 2021).

Our research contributes to the literature on women's entrepreneurship (Jennings & Brush, 2013) that has frequently taken a deficit-driven (role-incongruity) perspective and has only rarely incorporated a team-level perspective. We add to this line of research by showing that women's ownership (and *role-congruent* behavior) has varying performance implications depending on which performance measure is employed and on the ownership composition. Thus, we challenge the "female underperformance hypothesis" by highlighting that women owners might focus on different performance measures than men owners (Du Rietz & Henrekson, 2000; Justo, DeTienne, & Sieger, 2015) and add that gender-related behavioral tendencies (here: social proclivities and overconfidence, among others) emerge and complement each other differently depending on team size (Tang et al., 2021).

Second, we contribute to the strategic ownership literature, which so far has mostly discussed how owners' characteristics, such as their competence (Foss et al., 2021), the cognitive processes they use to form and test theories of value (Felin & Zenger, 2017; Zellweger & Zenger, 2023), and their preferences (Thomsen & Pedersen, 2000), influence firm value creation. We contribute to this research by elaborating on the gender of owners as an important determinant of firm value creation and by shifting interest from individual owners' judgment to the collective judgment of *owner teams* in shaping firm value creation.

3.2   Theoretical foundations

3.2.1   The strategic role of owners in value creation

The literature on the strategic role of firm owners in firm value creation builds on the premise that owners differ in both their theories of value (Schulze & Zellweger, 2021) and their judgment (Felin & Zenger, 2009; Zellweger & Zenger, 2023) of how to best allocate firm resources to create value (Felin & Zenger, 2017; Foss et al., 2021; Foss & Klein, 2020). Against

this background, previous work has discussed how the ownership form (Fitza & Tihanyi, 2017; McCann & Vroom, 2014; Schulze & Zellweger, 2021; Thomsen & Pedersen, 2000) and owners' characteristics, such as ownership competence (Foss et al., 2021), affect firm value creation.

Previous research has documented how eponymous entrepreneurs (Belenzon et al., 2017, 2020), owner-managers (McCann & Vroom, 2014; Schulze & Zellweger, 2021), and women business owners (Sexton & Bowman-Upton, 1990; Watson & Robinson, 2003) differ in their decision-making and resource allocation. For example, women business owners (vis-à-vis men business owners) have been shown to differ from men business owners in how they define "value," defining value to a lesser extent in terms of firm performance, money, and growth (Darnihamedani & Terjesen, 2020; Justo et al., 2015; Ladge, Eddleston, & Sugiyama, 2019; Robb & Watson, 2012) and to a greater extent in terms of non-financial, "communal," and family goals (Apesteguia et al., 2012; Folberg, Goering, Wetzel, Yang, & Ryan, 2023; Guzman et al., 2020; Yang & Aldrich, 2014). These differences are also evident in men's and women's various approaches to strategic decision-making in their firms, with women taking a more relational approach to build longstanding relationships with customers (Uzuegbunam & Uzuegbunam, 2018) and men taking actions, such as mergers and acquisitions, to grow their firms (Post et al., 2022).

Nevertheless, empirical findings on the performance implications of owners' gender (and associated preferences and behavior) are inconclusive: one stream of literature argues that women owners underperform relative to men owners (Fairlie & Robb, 2009; Yang & Del Carmen Triana, 2019), while another research stream finds no differences between men and women owners in terms of their performance (Kalleberg & Leicht, 1991). Both the *internal* drivers (e.g., differences in firms' resource allocation due to gender differences in preferences) and *external* drivers (e.g., [dis]advantages in stakeholder interactions due to *ascribed* gender

differences in competence and preferences, cf. Liao et al., 2023) underlying these findings are often explained by insights from social role theory, to which we now turn.

3.2.2 Gender-related behavioral tendencies: Social role theory

At the core of social role theory (Eagly, 1987) is the assumption that gender differences and similarities in behavior are the result of ingrained societal expectations that promote the display of women's and men's gender-congruent behavior (Eagly, 2018; Eagly & Karau, 2002). Historically, biological differences between men and women led to strong differences in social roles, exemplified by men as "resource providers" and women as "caretakers" (Eagly & Wood, 1999; Yang & Aldrich, 2014). In terms of societal beliefs, men are characterized as *agentic* (i.e., assertive, aggressive, self-confident) and women as *communal* (i.e., socially sensitive, empathetic, helpful) (Eagly, 1987). Indeed, these gender beliefs manifest in the actual behavioral tendencies of men and women because they are self-reinforcing through individuals' internalization of gendered self-concepts and through shared societal beliefs (Eagly, 2018; Eagly & Karau, 2002; Tang et al., 2021). These societal beliefs, as proposed by role congruence theory (an extension of social role theory) (Eagly & Karau, 2002), can lead to disadvantages when one's current role (e.g., a woman's leadership role) does not match the externally ascribed competence needed for this role (e.g., by team members), which in turn results in individuals displaying more gender-congruent behavior (Eagly & Karau, 2002).

In consequence, extensive research has described robust behavioral differences between women and men that are mostly consistent with these *agentic* and *communal* attributes (Eagly et al., 2003; Eagly & Karau, 2002). For example, there is evidence of men's general tendency to be more overconfident (Barber & Odean, 2001), to be more assertive (LePine & van Dyne, 1998), to take more risks, and to be more competitive (Gneezy & Rustichini, 2004; Powell & Ansic, 1997; Sutter & Glätzle-Rützler, 2015) than women. These tendencies manifest particularly in team interactions, in which men are more likely to strongly voice their opinions

and be directive (Hoogendoorn, Oosterbeek, & van Praag, 2013; LePine & van Dyne, 1998), while women are likely to exhibit greater social sensitivity and are thus more likely to perceive and consider the perspectives and emotions of other team members (Lyngsie & Foss, 2017; Tang et al., 2021). All these behavioral tendencies are evident in most environments and for most tasks, including the business context (Croson & Gneezy, 2009; Eagly et al., 2003). However, two behavioral tendencies of men and women that have been associated with firms' resource allocation and thus likely affect firm growth and survival are overconfidence and social proclivities, which we introduce in the following.

3.2.3 The role of overconfidence in resource-allocation decisions

The overconfidence bias describes an individual's overestimation of the quality and accuracy of their judgment (Kaplan et al., 2022; Moore & Cain, 2007).[21] As a result of this overestimation, entrepreneurship scholars have found positive relationships between entrepreneurs' overconfidence and both entering entrepreneurship (Cooper, Woo, & Dunkelberg, 1989) and coping with setbacks (Busenitz & Barney, 1997; Hayward, Forster, Sarasvathy, & Fredrickson, 2010). However, entrepreneurs' overconfidence has also been linked to underestimating competition and the resources needed for firms' operations (Hayward et al., 2006; Simon & Houghton, 2003), making risky resource allocations (Simon & Houghton, 2003), engaging in excess entries (Camerer & Lovallo, 1999; Wu & Knott, 2006), and setting unattainable goals (Brändle, Berger, Golla, & Kuckertz, 2018). Related results from other management disciplines appear to be very similar, with research finding, for example, effects of CEOs' overconfidence on "distorted corporate decisions" (cf. Kaplan et al., 2022), on CEOs' risk-taking (Burkhard et al., 2023; Faccio, Marchica, & Mura, 2016; Huang & Kisgen, 2013;

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[21] Judgment involves making decisions about the future in situations where clear decision models and rules cannot be meaningfully applied, such as when it is difficult to assign probabilities to desired outcomes indefinitely (Foss, Klein, & Bjørnskov, 2019). Based on a meta-analysis of Moore and Healy (2008), overconfidence involves three dimensions of "distorted judgment": (1) overestimation of one's own performance, (2) overplacement (of one's performance) relative to others ("better than average effect"), and (3) overprecision in judgment (e.g., regarding the accuracy of one's judgment).

Schumacher, Keck, & Tang, 2020) and on value-destroying acquisitions (Malmendier, Tate, & Yan, 2011). A recent meta-analysis suggests a net positive effect of CEOs' overconfidence on firm performance, mainly explained by performance-enhancing risk-taking (Burkhard et al., 2023).

There is also some limited research at the team level discussing how founding teams need to adjust their decision-making (and, by extension, allocate decision-making authority) in response to differing levels of individuals' overconfidence (Chen, Elfenbein, & Posen, 2022), research investigating the relationship between team-level overconfidence and risk perceptions (yielding insignificant effects, see Houghton, Simon, Aquino, & Goldberg, 2000), and research discussing the role of women board representation in reducing men CEOs' overconfidence (Chen et al., 2019). This previous research has suggested that individuals' overconfidence also generally plays a role in the team context (Kerr & Tindale, 2004; Sunstein & Hastie, 2014).

3.2.4 The role of social proclivities in resource-allocation decisions

The social proclivities of men and women (resulting from gendered social roles) appear to alter how individuals navigate social interactions and are particularly evident in team settings, in which they shape team interactions (Woolley, Chabris, Pentland, Hashmi, & Malone, 2010; Woolley, Chow, Mayo, Riedl, & Chang, 2023). In the context of firm-level decision-making, women's involvement is expected to increase the social sensitivity in teams and to foster a safe environment, team reflexivity (Godwin, Stevens, & Brenner, 2006; Hoogendoorn et al., 2013; Lyngsie & Foss, 2017; Santos & Neumeyer, 2022; Tang et al., 2021), and critical deliberation (Chen et al., 2019; Farh et al., 2020).

Thus, women's social proclivities have important implications for firm decision-making and performance (Hoogendoorn et al., 2013), such as a positive association with the realization of new business opportunities (Lyngsie & Foss, 2017), better access to resources (Santos & Neumeyer, 2022), more innovativeness (Dai, Byun, & Ding, 2019), higher investments in

research and development (Apesteguia et al., 2012), a stronger ambidextrous strategic orientation (Tang et al., 2021), and more emphasis on strategic renewal compared to risk-entailing acquisitions (Post et al., 2022).

3.3 Hypothesis development

3.3.1 The effects of owner teams' gender composition on firm growth and survival

Firm growth is a consequence of owners' conscious decisions to employ underutilized resources to grow their firms (Gilbert, McDougall, & Audretsch, 2006; Penrose, 1959). Thus, first and foremost, owners' idiosyncratic preferences and judgment about how to *best* employ firm resources strongly influences firms' strategic direction and growth (Felin & Zenger, 2017; Foss & Klein, 2020; Penrose, 1959). The dependency of firm growth on owners' judgment is also evidenced in Penrose's work (1959: 40–41), who argued that "the judgment regarding which of several alternative possibilities is 'best' will, of course, for any given firm be influenced by the attitude of the firm's entrepreneurs towards risk and by their ideas about the kind of action appropriate to their firm."[22] Thus, we argue that each owner's (gendered) preferences and behavior influence the focal team's collective judgment, likely at least in part in proportion to their ownership shares (and associated decision-making authority).

Consistent with predictions made by social role theory, we contend that when women hold no or a low percentage of ownership shares, there is likely a polarization toward risk-entailing and agentic action-first strategic decision-making (Farh et al., 2020; Isenberg, 1986; Myers & Lamm, 1976). This polarization may include entering new markets excessively (Camerer & Lovallo, 1999; Gutierrez, Åstebro, & Obloj, 2020; Wu & Knott, 2006) and "building empires" by acquiring and eliminating competitors (see comparable arguments in Malmendier et al., 2011; Penrose, 1959), as suggested by the overconfidence literature, and

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[22] Importantly, Penrose defined entrepreneurs as individuals or groups offering entrepreneurial services to their firms regardless of their position. Particularly in smaller firms, owners have substantial decision-making authority, making owners' judgment and their idiosyncratic theories of value and preferences important influence factors for firm growth.

likely leads to a higher level of owner teams' "experimenting with new and alien lines of activities" (Penrose, 1959: 32).

In contrast, when women hold a higher percentage of ownership shares, owner teams' collective judgment may be characterized less by risk-entailing and agentic action-first perspectives either because men's overconfidence is mitigated (cf. Chen et al., 2019) or because decision-making is less biased toward growth ex ante in firms fully owned by women. In fact, since women appear to increase the likelihood of critical deliberation in teams through both their social proclivities and potentially divergent perspectives (Chen et al., 2019; Farh et al., 2020; Post et al., 2022), it is likely that with a higher percentage of ownership shares held by women, owner teams are more inclined to find a balance between growing their firms and not overinvesting in risky growth strategies (Chen et al., 2019) and are likely to set more attainable and non-economic (i.e., not performance-related) goals (Brändle et al., 2018; Guzman et al., 2020; Simon & Houghton, 2003). This choice of a balanced growth strategy is facilitated by an increased likelihood that all owners will participate in decision-making and will constructively challenge each other's perspectives (Dreu & West, 2001; Godwin et al., 2006; Tang et al., 2021; Woolley et al., 2010), which likely inhibits the allocation of resources to (excessive) expansion.

Our second argument relates to the consequences of *externally* ascribed gender differences manifesting in systematic barriers that women face relative to men in obtaining funding and other critical resources from external stakeholders (Kanze, Huang, Conley, & Higgins, 2018; Lee & Huang, 2018; Liao et al., 2023). For instance, important stakeholders, such as bank loan officers (Buttner & Rosen, 1988) and investors (Kanze et al., 2018; Lee & Huang, 2018), may *perceive* women owners as less competent in business contexts (Ahl, 2006; Kalnins & Williams, 2021; Kray, Kennedy, & van Zant, 2014). Capital lenders' perceptions are considered a consequence of the ascribed tendencies associated with their gender (e.g., their confidence, risk preferences, and business orientation). Thus, in teams with a higher percentage

of ownership shares held by women, resulting disadvantages for women likely serve as an additional barrier to the pursuit of firm growth. Thus, we conclude the following:

Hypothesis 1a. *There is a negative relationship between the percentage of ownership shares held by women and firm growth.*

Private firms face severe challenges, including resource constraints (Katila, Chen, & Piezunka, 2012) and the liability of smallness (Brüderl & Schüssler, 1990; Stinchcombe, 1965), suggesting that owners' judgment plays a critical role in realistically assessing competition and market demand (Hayward et al., 2006) and in taking calculated risks (cf. Faccio et al., 2016) to ensure long-term firm survival. Consistent with our arguments for Hypothesis 1a, we contend that when women hold no or a low percentage of ownership shares, owner teams are more likely to prioritize competitive and risk-entailing strategies driven by an underestimation of competition and the resources needed for their firms' operations (Camerer & Lovallo, 1999; Hayward et al., 2006) and by an overestimation of their own agency in influencing their firms' trajectories (Eagly, 1987; Forbes, 2005). Importantly, these distorted firm decisions make firms vulnerable to failure in the following years (Chen et al., 2019; Ho et al., 2016; Kaplan et al., 2022). When women hold a higher percentage of ownership shares, on the other hand, firm decision-making is likely more focused on *communal* goals, such as preserving employees' jobs (Folberg et al., 2023) and investing in sustainability initiatives (Apesteguia et al., 2012), and is likely less biased toward growth and risk, which manifests in more sustainable risk-taking and strategies that do not jeopardize firm survival over firm growth (Faccio et al., 2016; Shepherd, Douglas, & Shanley, 2000).

We argue that access to resources may be reduced for owner teams with a higher percentage of ownership shares held by women. While it is reasonable to expect such resource scarcity to negatively affect firm survival (Yang & Del Carmen Triana, 2019), it may also urge owners to create value from reallocating existing firm resources (Felin et al., 2023) or to engage in bootstrapping (Brush, Carter, Gatewood, Greene, & Hart, 2006), which may stabilize

business operations and hence positively influence firm survival. We also note that any reallocation of firm resources constitutes a *creative team act* (Foss, Klein, Kor, & Mahoney, 2008) that requires open deliberation of the unique perspectives of all team members. In turn, such deliberation is facilitated by higher levels of social sensitivity and reflexivity in a group (Chen et al., 2019; Santos & Neumeyer, 2022; Woolley et al., 2010). Also, the limited reliance on external resources due to bootstrapping may prove beneficial when a crisis arises (Ho et al., 2016) and access to external resources may be difficult and when pursuing value creation other than growth (e.g., profitability or survival). Notably, evidence that investors who tend to fund men owners miss out on opportunities and superior performance (Calder-Wang & Gompers, 2021; Koning, Samila, & Ferguson, 2021) reinforces the proposition that access to financing and other resources does not necessarily affect firms' actual development in a negative way. Thus, we contend the following:

> **Hypothesis 1b.** *There is a positive relationship between the percentage of ownership shares held by women and firm survival.*

3.3.2 The moderating effect of the number of firm owners

Next, we argue that as the number of co-owners increases, the baseline relationships between the percentage of ownership shares held by women and both firm growth and firm survival become more positive for the following reasons.

The quality of collaboration and cooperation among co-owners appears to be critical for firm growth (Bird & Zellweger, 2018; Kor, 2003). This cooperation among team members is so crucial because any growth-related decision is inherently uncertain, requiring the labor, knowledge, and judgment of each team member (Penrose, 1959). Thus, larger owner teams potentially have a growth advantage over smaller teams but only if each team member is given the possibility to contribute their idiosyncratic knowledge and resources to their respective team and if the team is able to collectively reflect on team goals and strategies. This accumulation and exchange of knowledge and other resources is supported by "high-quality" team

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interactions characterized by team reflexivity, psychological safety, and cognitive (but not affective) conflict (Amason & Sapienza, 1997; Santos & Neumeyer, 2022; Tang et al., 2021; Van Knippenberg & Schippers, 2007; West III, 2007), all of which are facilitated by women's social sensitivity and potentially inhibited to some extent by men's assertiveness.

Thus, we propose that a higher percentage of ownership shares held by women facilitates teams' ability to reap the (potential) benefits of greater team resources, which may (eventually) offset the growth disadvantage resulting from lower polarization toward risk and competition in teams. Moreover, due to their positive team interactions, co-owners may learn from each other (Carton & Cummings, 2013; Gibson & Vermeulen, 2003) and recognize why excessive growth may be harmful for a firm's long-term perspective while moderate growth may be beneficial (Chen et al., 2019; Schulz-Hardt, Jochims, & Frey, 2002). In addition, larger teams are more likely to have both men and women as owners, which makes it more likely that the behavioral tendencies of women and men are complementary in cultivating positive team dynamics (see Tang et al., 2021).

Moreover, we argue that the growth-reducing effect for teams with a higher percentage of ownership shares held by women, which emerges from reduced access to resources due to ascribed gendered beliefs about business competence (Kanze et al., 2018), is less severe for larger teams (Pfeffer & Salancik, 1978). For example, research has shown that larger corporate boards (e.g., Alexander, Fennell, & Halpern, 1993) are better able to secure access to critical and diverse resources for their firms, resulting in better firm growth (see meta-analysis by Dalton, Daily, Johnson, & Ellstrand, 1999). This argument also applies to private firm owners (i.e., typically board members in their firms by default). Thus, we posit the following:

Hypothesis 2a. *The negative relationship between the percentage of ownership shares held by women and firm growth is weaker for firms with a higher number of owners.*

In terms of firm survival, we also expect that in larger teams, a higher percentage of ownership shares held by women is particularly valuable in reducing polarization toward risk and

enhancing critical deliberation about firms' strategic orientation, which should reinforce the positive survival effect. Specifically, larger teams are exceptionally prone to polarizing toward (potentially survival-threatening) risk-taking (Isenberg, 1986; Kaplan, 2008; Moscovici & Zavalloni, 1969; Myers & Lamm, 1976), a tendency that is likely inhibited when women hold a higher percentage of ownership shares. In addition, the increased quality of team interactions likely allows owner teams to better leverage each owner's unique knowledge and perspective of how to reallocate existing firm resources to create value for their firms (Felin et al., 2023). Finally, for teams with a higher percentage of ownership shares held by women, the disadvantages related to obtaining funding (Liao et al., 2023; Yang & Del Carmen Triana, 2019) are also likely less critical because owners in larger teams naturally have more access to both internal and external resources. Therefore, we contend the following:

> **Hypothesis 2b.** *The positive relationship between the percentage of ownership shares held by women and firm survival is stronger for firms with a higher number of owners.*

3.4   Research method

3.4.1   Data collection

We first identified a sample of entrepreneurial firms from France, Italy, and Spain using Bureau van Dijk's Orbis database. The Orbis database contains reliable annual firm-level data, including financial, ownership, and top management information, and is exceptionally rich for private firms. Our final sample included 42,673 firms that were active for at least two years between 2011 and 2019, were no older than 20 years (cf. Bird & Zellweger, 2018), and were owned by at least two and no more than 10 owners. Given our focus on small and medium-sized private firms, we only included firms that had a minimum of 10 and a maximum of 249 employees during the observation period (i.e., we excluded micro and large firms). About 27% of the firms failed during the observation period.

3.4.2 Measures

We measured our dependent variable at time t, while all other variables were lagged one year (at t – 1) to avoid simultaneity bias (Weng & Lin, 2014).

Dependent variables. Our first dependent variable was firm growth. Firm growth is typically measured in terms of an expansion of firm human resources (employee growth) or revenues (sales growth) (Brush & Vanderwerf, 1992; Delmar et al., 2003). We focused on sales growth because previous research has revealed substantial differences in sales growth between men and women business owners (e.g., Du Rietz & Henrekson, 2000). We calculated the yearly growth rate for each firm i at point t as the logarithmic difference in sales compared to the previous year. The variable was computed as $g_i,t = ln$ [sales t] $- ln$ [sales $t - 1$] and was winsorized by 1% at each tail to reduce the impact of outliers.

Our second dependent variable was firm survival. The Orbis database allows for inference of the time of exit (i.e., the year a firm files for bankruptcy or insolvency) in the data. We thus constructed a variable *firm survival* that equaled 1 if a firm exited in a given year and 0 for all previous years the firm existed starting with the year of the firm's incorporation (Soto-Simeone, Sirén, & Antretter, 2020).

Independent variable. Our independent variable assessed the percentage of shares held by women owners *(women shares)* as a proxy for their decision-making authority (similar to Anderson & Brion, 2014; Chen et al., 2019; Lyngsie & Foss, 2017). As the distribution of the variable was skewed, we took the natural logarithm.

Moderating variable. For our moderating analyses, we calculated the total *number of owners* in each year (Bird & Zellweger, 2018).

Controls. We controlled for several variables that have been associated with firm growth in previous research. First, we controlled for *firm age*, measured as the number of years since a firm was incorporated, because research has shown that firm growth declines as firms mature (Evans, 1987). Because the distribution of firm age was skewed, we took the natural

logarithm of firm age. We controlled for *firm size* because firm growth is known to decline as firm size increases (Delmar et al., 2003; Sutton, 1997). We used the logarithm of total assets as a proxy for firm size (Crossland, Zyung, Hiller, & Hambrick, 2014).

We also controlled for whether the focal firm was a family firm because family and non-family firms differ in their growth aspirations and survival (Gómez-Mejía et al., 2007). We coded a variable (*family firm*) equal to 1 if at least one owner was part of an owning family and 0 otherwise. We followed Miller et al. (2008) in defining a family firm as one in which at least two individuals from one family were involved in ownership and/or management. We also employed a dummy variable for *institutional shareholders* within the ownership structure (coded as 1 for the presence of such shareholders and otherwise 0) because the inclusion of institutional investors increases owners' access to resources and because this inclusion is typically associated with a greater focus on risk-taking and firm growth (Bushee, 1998; McCahery et al., 2016). We further controlled for the *number of external managers* because the appointment of external managers is an indicator of firm professionalization and can thus be associated with higher firm growth (Hellmann & Puri, 2002; Schulze & Zellweger, 2021; Wasserman, 2017). Since the distribution was skewed, we took the natural logarithm. We also controlled for the *coefficient of variation in ownership* to measure how equally the equity was distributed within a firm. To obtain this measure, we divided the standard deviation and the mean of all individual firm owners' ownership shares (Harrison & Klein, 2007). If ownership was equally distributed (e.g., two owners each owning 50% of a firm), the variable took the value of 0. We also obtained the *percentage of owner-managers* in a firm by dividing the number of owners who held a managerial position in the firm by the total number of owners for each year.

We further controlled for *leverage* to assess the financial health of a firm (George, 2005). We additionally introduced a quadratic term (*leverage^2*) to account for non-linear effects of leverage on firm growth (see Korteweg, 2010). We calculated leverage as the sum of current

and non-current liabilities divided by total assets (e.g., see Giordani et al., 2014). We also included the natural logarithm of a firm's return on assets (*ROA*) to control for the firm's profitability (Demirgüç-Kunt & Maksimovic, 1998). In all models, we employed fixed effects on the country, year, and industry levels (based on the two-digit level of the Nomenclature of Economic Activities) (Audretsch, 1995).

Correction for survivorship bias. Although we employed an unbalanced panel (i.e., we required only two yearly observations per firm to be able to calculate at least one growth rate per firm), there remained the concern that survivorship bias may have led to sample selection bias favoring surviving and thus growing firms (e.g., Colombo & Grilli, 2005). To correct for this potential bias, we ran a two-stage Heckman model (Heckman, 1979) that calculated a selection variable based on a Cox proportional hazard model controlling for firm exit (Lee, 1983). We used all variables from the main analysis (except year dummies in order to reduce multicollinearity with respect to *time to exit*) and ran the analysis on the sample of firms we derived *before* restricting our sample to the study's main sample (i.e., 434,554 firms and 1,910,583 firm-year observations). We report the first stage of the Heckman correction in Table B1 in Appendix B. We included the computed selection parameter—which we call *IMR* in line with the literature—in all regression models (e.g., Taylor & Greve, 2006).

3.4.3 Analytical procedures

For our analyses related to firm growth (Hypotheses 1a and 2a), we employed panel regressions with robust clustered standard errors at the firm level. Given that ownership structures change infrequently for the majority of private firms, we used random effects models for our analyses (Benson & Davidson, 2009; Ongsakul et al., 2021). For our analyses related to firm survival (Hypotheses 1b and 2b), we relied on Cox proportional hazard models (Cox, 1972).

3.4.4 Results

Table 6 and Table 7 show the intercorrelation matrix and descriptive statistics for our sample. Overall, across all firm-year observations, 22.90% (SD = 29.23%) of the ownership shares were held by women on average. In 38.21% of all firms, at least one women owner was part of the ownership structure. On average, firms had 2.83 (SD = 1.21) owners and 25.68 (SD = 22.49) employees and were 10.81 (SD = 5.85) years old on average. All variance inflation factors are below 2, indicating that multicollinearity is unlikely to be a problem.

Table 8 reports the results of the regression analysis employing firm growth as the dependent variable, corresponding to Hypotheses 1a and 2a. Model 1 provides strong support for Hypothesis 1a. Specifically, we found that an increase in the percentage of ownership shares held by women is associated with a decrease in firm growth (β = -0.043, p = .000). These results signify that a 50% increase in the percentage of ownership shares held by women results in a decrease of approximately 2% in firm growth. Given that these are annual figures, this represents a significant reduction in sales growth over a longer time horizon. For example, after 12 years (i.e., the median age of the firms in our sample), a 50% increase in the percentage of ownership shares held by women would imply a decrease in total sales of approximately 20%.[23]

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[23] Based on the following calculation: [(1-0.018)^12-1] $\times$ 100%

Table 6. Correlations of the variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Sales Growth	1.000												
(2) Women Shares (Log)	-0.003	1.000											
(3) Firm Age (Log)	-0.255	-0.073	1.000										
(4) Firm Size (Log)	-0.153	-0.087	0.405	1.000									
(5) Family Firm (0/1)	-0.028	0.007	0.039	0.102	1.000								
(6) Institutional Shareholders (0/1)	0.004	-0.103	-0.021	0.072	-0.064	1.000							
(7) Number of External Managers (Log)	-0.038	-0.005	0.069	0.144	0.119	0.112	1.000						
(8) Coefficient of Variation in Ownership	0.008	-0.026	-0.081	0.034	-0.022	0.109	-0.012	1.000					
(9) IMR (Survivorship Bias)	-0.025	-0.011	-0.081	-0.100	0.015	0.057	0.170	0.039	1.000				
(10) Leverage	0.058	0.017	-0.286	-0.199	-0.007	0.014	-0.030	0.070	0.065	1.000			
(11) ROA (Log)	0.021	0.006	-0.086	-0.170	-0.027	-0.006	-0.054	-0.002	-0.104	-0.332	1.000		
(12) Number of Owners	-0.030	0.028	0.070	0.115	0.237	0.096	-0.023	0.100	-0.018	-0.047	-0.004	1.000	
(13) Percentage of Owner-Managers	0.005	-0.056	0.138	0.021	-0.105	-0.147	-0.354	-0.168	-0.354	-0.085	0.042	-0.129	1.000

Table 7. Mean, median, standard deviation, and quartiles for key variables

Variable	Obsv.	Mean	Median	SD	Min	p10	p90	Max
Sales Growth	171,338	0.050	0.032	0.261	-1.441	-0.174	0.280	1.514
Women Shares (Log)	171,338	0.181	0.049	0.217	0.000	0.000	0.507	0.693
Firm Age (Log)	171,338	2.285	2.485	0.693	0.000	1.099	2.996	3.045
Firm Size (Log)	171,338	14.457	14.470	1.088	8.771	13.061	15.831	17.137
Family Firm (0/1)	171,338	0.619	1.000	0.486	0.000	0.000	1.000	1.000
Institutional Shareholders (0/1)	171,338	0.057	0.000	0.233	0.000	0.000	0.000	1.000
Number of External Managers (Log)	171,338	0.357	0.000	0.499	0.000	0.000	1.099	3.526
Coefficient of Variation in Ownership	171,338	0.464	0.345	0.493	0.000	0.000	1.273	3.136
IMR (Survivorship Bias)	171,338	0.841	0.715	0.622	0.000	0.128	1.778	4.470
Leverage	171,338	0.762	0.816	0.202	0.067	0.463	0.966	1.750
ROA (Log)	171,338	1.306	1.358	1.218	-4.605	-0.211	2.815	3.841
Number of Owners	171,338	2.828	2.000	1.209	2.000	2.000	4.000	10.000
Percentage of Owner-Managers	171,338	0.540	0.500	0.351	0.000	0.000	1.000	1.000

Table 8. Random-effects panel regressions for sales growth

Dependent Variable: Sales Growth	(1)	(2)
Firm Age (Log)	-0.118***	-0.118***
	(0.002)	(0.002)
Firm Size (Log)	-0.046***	-0.046***
	(0.001)	(0.001)
Family Firm (0/1)	0.002	0.001
	(0.002)	(0.002)
Institutional Shareholders (0/1)	0.011**	0.011**
	(0.004)	(0.004)
Number of External Managers (Log)	-0.002	-0.002
	(0.002)	(0.002)
Coefficient of Variation in Ownership	-0.000	-0.000
	(0.002)	(0.002)
IMR (Survivorship Bias)	0.008	0.008
	(0.010)	(0.010)
Leverage	0.037	0.037
	(0.025)	(0.025)
Leverage^2	-0.093***	-0.093***
	(0.019)	(0.019)
ROA (Log)	-0.021***	-0.021***
	(0.001)	(0.001)
Number of Owners	0.003***	0.000
	(0.001)	(0.001)
Percentage of Owner-Managers	0.040***	0.040***
	(0.006)	(0.006)
Independent Variable		
Women Shares (Log)	-0.043***	-0.082***
	(0.004)	(0.011)
Moderating Effects		
Women Shares x Number of Owners		0.015***
		(0.004)
Country Fixed Effects	Y	Y
Industry Fixed Effects	Y	Y
Year Fixed Effects	Y	Y
Constant	0.929***	0.937***
	(0.031)	(0.032)
Observations	171,338	171,338
Number Firms	42,673	42,673
R-Squared Overall	0.080	0.080
R-Squared Between	0.133	0.134
R-Squared Within	0.117	0.117

Note: Robust standard errors are in parentheses (clustered at the firm level); + $p <$ .10, * $p < .05$, ** $p < .01$, *** $p < .001$.

Model 2 shows the interaction effect of the percentage of ownership shares held by women and the number of owners. We found evidence of a positive interaction effect between the percentage of ownership shares held by women and the number of owners ($\beta = 0.015$, $p = .000$).[24]
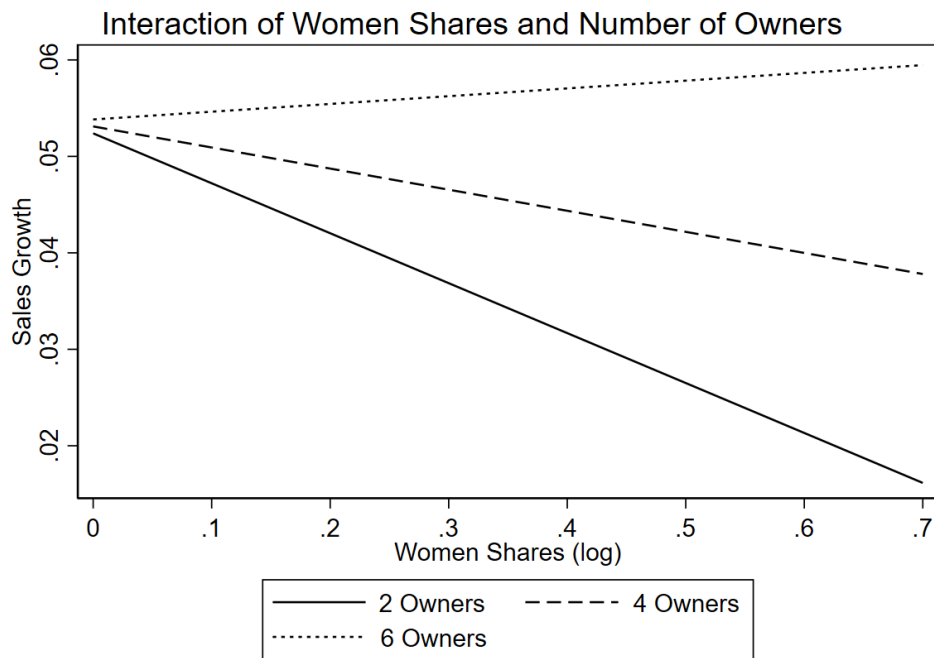
Figure 5. Moderating effect of the number of owners (firm growth)

The marginal effects are displayed in Figure 5. Simple slope analyses provide evidence that the relationship between the percentage of ownership shares held by women and firm growth is less negative in firms with four owners ($\beta = -0.022$, $p = .001$) vis-à-vis those with two owners ($\beta = -0.052$, $p = .000$) and that the effect even becomes non-significant for firms with six owners ($\beta = 0.008$, $p = .526$). For eight or more owners, the effect becomes positive and statistically

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[24] This coefficient implies that a change in the number of owners from the 10th percentile (two owners) to the 90th percentile (four owners) corresponds to a 10% increase in the coefficient for the effect of the percentage of ownership shares held by women on firm growth when holding the percentage of ownership shares held by women constant at its mean. The marginal effects show that when holding the percentage of ownership shares held by women at its mean (i.e., 0.126), firm growth changes from $\beta = 0.046$ ($p = .000$) to $\beta = 0.050$ ($p = .000$) in a firm with two owners vis-à-vis a firm four owners.

significant at $p < .05$ (e.g., for 9 owners, the effect is $\beta = 0.068$, $p = .012$). All in all, these results support the theorizing underlying Hypothesis 2a.

Table 9 reports the results of our analyses with firm survival as the dependent variable, corresponding to Hypotheses 1b and 2b. Our results provide strong evidence that the percentage of ownership shares held by women is associated with a lower likelihood of firm exit ($\beta = -0.247$, $p = .000$), lending support to Hypothesis 1b. In terms of the exit hazard, this result means that a firm owned exclusively by women is 22% less likely to exit (i.e., more likely to survive) than a firm owned exclusively by men. In support of Hypothesis 2b, we also found that this effect is more negative (i.e., firms are even less likely to exit) in firms with a higher number of owners ($\beta = -0.107$, $p = .020$).

Table 9. Survival model—Factors predicting the likelihood of exit

Variables	Coefficients (Robust Errors)	Coefficients (Robust Errors)
Women Shares (Log)	-0.247***	0.024
	(0.041)	(0.122)
Women Shares x Number of Owners		-0.107*
		(0.046)
Firm Age (Log)	-0.021	-0.021
	(0.015)	(0.015)
Firm Size (Log)	-0.164***	-0.164***
	(0.012)	(0.012)
Family Firm (0/1)	-0.001	0.003
	(0.019)	(0.019)
Institutional Shareholders (0/1)	0.050	0.048
	(0.035)	(0.035)
Number of External Managers (Log)	0.344***	0.343***
	(0.021)	(0.021)
Coefficient of Variation in Ownership	0.024	0.023
	(0.018)	(0.018)
IMR (Survivorship Bias)	-1.009***	-1.010***
	(0.111)	(0.111)
Leverage	-1.908***	-1.912***
	(0.174)	(0.174)
Leverage^2	1.489***	1.491***
	(0.119)	(0.118)
ROA (Log)	-0.100***	-0.100***
	(0.009)	(0.009)
Number of Owners	-0.092***	-0.073***
	(0.009)	(0.012)
Percentage of Owner-Managers	-1.961***	-1.962***
	(0.067)	(0.067)
Industry Dummies	YES	YES
Country Dummies	YES	YES
Observations	192,756	192,756
Number Firms	42,461	42,461
Number Failures	11,490	11,490
Wald Chi-Squared	5,515***	5,526***

Note: Robust standard errors are in parentheses; $+ p < .10$, $* p < .05$, $** p < .01$, $*** p < .001$; IMR was derived to address the selection bias when restricting the sample to firms that had at least one growth rate (i.e., at least two firm-year observations). Our results are robust when excluding IMR.

The marginal effects are displayed in Figure 6. Here, we present the firms' hazard ratios contingent on different percentages of ownership shares held by women and for different numbers of co-owners. As evident in Figure 6, the likelihood of firm exit is lowest in larger firms with a higher percentage of ownership shares held by women.
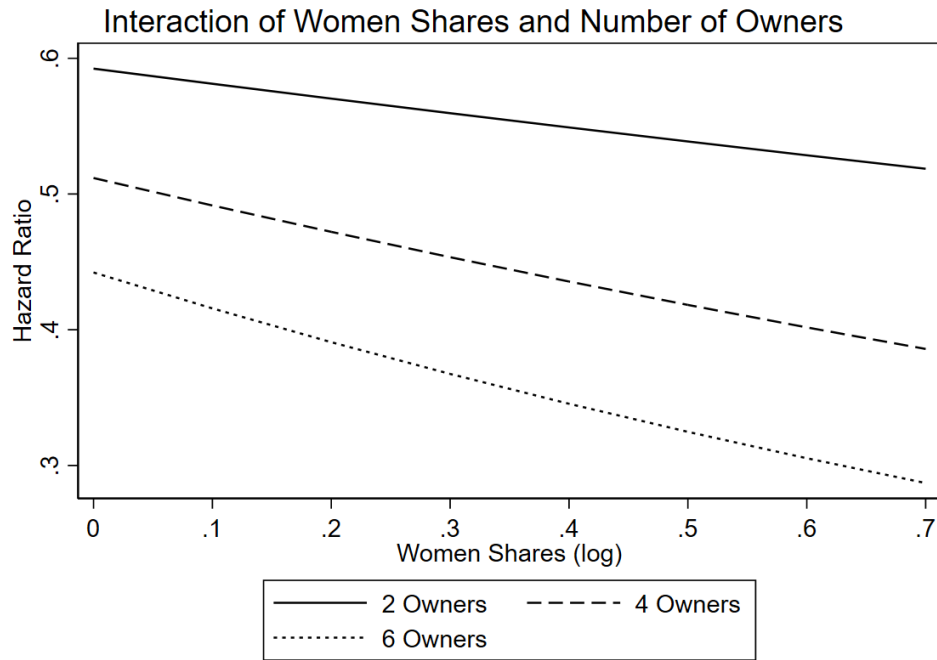
Figure 6. Moderating effect of the number of owners (firm survival)

3.5 Additional analyses

We took several steps to test the robustness of our analyses. We report the robustness checks separately for analyses with firm growth and firm survival as the dependent variables and present additional exploratory analyses focusing on the interplay of the percentage of ownership shares held by women, firm risk-taking, firm growth, and firm survival in the following.

3.5.1 Robustness checks for analyses with firm growth

First, we tested the robustness of the main effect. Specifically, we used a dummy variable equal to 1 if at least one woman and one man was part of the ownership structure (and 0 otherwise) as an alternative independent variable, which yielded results consistent with our main analysis. We also matched firm-year observations with at least one woman in the ownership structure to firm-year observations with only men in the ownership structure using propensity score matching (Narita, Tena, & Detotto, 2023). In doing so, we were able to identify a control sample of firm-year observations that did not include women in the ownership structure and that had

no significant differences in observable characteristics (confounders), enabling us to get less biased coefficients for our estimated main effect (Rosenbaum & Rubin, 1983). In the first stage, we used all control variables used in the main analysis to derive the propensity scores. All results remain qualitatively consistent in the matched sample.

To address additional endogeneity concerns stemming from omitted variable bias (i.e., variables influencing both the percentage of ownership shares held by women and firm growth) and reverse causality (i.e., women being less likely to self-select into growth-oriented firms), we also used an instrumental variable approach with two instruments. As a first instrument, we used the average percentage of ownership shares held by women within the same two-digit industry NACE codes. This instrument addresses the idea that women's ownership is more prevalent in certain industries (Faccio et al., 2016). The instrument satisfies the exclusion restriction because other firms cannot collectively influence outcomes in a focal firm (e.g., see Rawley, Godart, & Shipilov, 2018). As a second (firm-level) instrument, we chose the absolute number of women owners. This instrument addresses the idea that the absolute number of women owners influences firm growth only *through their authority* to decide on their firms' resource allocation, which is inextricably tied to their ownership rights. Together, the two instruments are relevant predictors of our independent variable (Kleibergen-Paap rk LM statistic $p = .000$). The results we obtained with a random effects generalized two-stage least squares instrumental variable regression remain similar to those from our main analysis and only slightly reduce in magnitude ($\beta = -0.031$, $p = .000$).

Next, to verify that our results are indeed driven by women's decision-making authority related to their ownership shares, we created two mutually exclusive variables that "split" our independent variable into two sub-categories (the percentage of shares held by *women owner-managers* and the percentage of shares held by *women non-managing owners*). Owner-managers have greater discretion and influence over the allocation of firm resources, which should elevate their influence (Staw, 1991). As expected, when including these two variables

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(instead of our main independent variable) in our main regression, we found the effect for the percentage of shares held by women owner-managers ($ß = -0.054$, $p = .000$) to be more negative than the effect for the percentage of shares held by women non-managing owners ($ß = -0.029$, $p = .000$). A dominance analysis—an analysis to compare the relative importance of predictors in a regression—using the Stata package *domin* (see Luchman, 2021) revealed that the coefficients are substantially different (i.e., the first coefficient fully dominates the second coefficient).

In addition, following the suggestion of Shepherd and Wiklund (2009), we re-ran our analysis using employee growth as an alternative dependent variable. Employee growth is another robust growth measure (Shepherd & Wiklund, 2009) and has the advantage of being less subject to market fluctuations (Delmar, 2006). Again, the percentage of ownership shares held by women is negatively associated with employee growth ($β = -0.015$, $p = .000$).

Second, part of our theorizing for Hypothesis 2—the moderating effect of the number of firm owners—implicitly assumes (or may be at least more applicable to) the presence of men co-owners. We therefore repeated our analyses using the absolute number of men owners (and controlling for the number of women owners) as an alternative measure for our *number of owners* variable and found similar results for the interaction term ($β = 0.011$, $p = .000$).

Third, we restricted our sample to firms not older than 10 years to align with more conservative definitions of an entrepreneurial venture and to verify that our results extend to younger firms (Forbes, 2005; Jin, Madison, Kraiczy, Kellermanns, Crook, & Xi, 2017). The results are displayed in Table B2 in Appendix B and corroborate the findings from our main analysis.

Fourth, we used fixed effects models to have a more restrictive setting considering only within-firm variation and, accordingly, to reduce the risk of omitted variable bias (Bell & Jones, 2015). Our results are consistent with our main analysis and are reported in Table B3 in Appendix B.

3.5.2 Robustness checks for analyses with firm survival

As before, we first used a dummy variable indicating the presence of at least one woman and one man owner in the ownership structure as an alternative independent variable. The results are consistent with our main analysis (β = -0.138, p = .000), implying that the exit hazard is reduced by 12.9% in teams with a gender mix compared to teams without a gender mix.

We also re-ran our analysis for a sub-sample of firms not older than 10 years and present the results in Table B4 in Appendix B. The results for both the main and moderating effects are similar and even increase in magnitude and significance. This strengthening of the effect sizes supports our theorizing that, especially in the early years of a firm, characterized by high levels of uncertainty and the liability of newness, the level of overconfidence and competitiveness within a team is antithetical to firm survival.

We also repeated our analyses using the absolute number of men owners (and controlling for the number of women owners; see above in the robustness checks for firm growth) as an alternative measure for our *number of owners* variable and found similar results for the interaction term (β = -0.106, p = .000). This finding supports our reasoning that in larger teams, the behavioral tendencies of men and women may even become complementary and positively relate to both survival and growth.

3.5.3 Exploratory analysis—The role of risk-taking

To provide additional evidence for the critical role of overconfidence (and further gendered behavioral tendencies) in explaining our results, we used *firm-level risk-taking* as an alternative dependent variable for our panel regressions. In line with previous research, we calculated the volatility of firm-level profitability over a three-year period (Faccio, Marchica, & Mura, 2011; John, Litov, & Yeung, 2008)[25] as a measure of firm-level risk-taking. Consistent with our

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[25] Specifically, for every year, we measured industry-adjusted profitability in terms of the difference between a firm's ROA (defined as earnings before interest and taxes divided by total assets) and the average ROA of firms in the same industry. The final volatility index was a yearly measure based on the variability of profitability in the timeframe of the focal year and the two previous years.

hypothesizing, we found that an increase in the percentage of ownership shares held by women is negatively associated with this variable (β = -0.193, p = .038).

We hypothesized that reduced levels of excessive risk-taking (which we argue to be more common in teams with a lower percentage of ownership shares held by women) partly explain the positive effect of the percentage of ownership shares held by women on firm survival. We therefore tested whether firm-level risk-taking is associated with a higher probability of firm exit. The analysis supports this theoretical relationship (β = 0.01, p = .000). In practical terms, this means that an increase of one standard deviation in firm-level risk-taking (SD = 5.79) is associated with a 4% higher probability of firm exit (i.e., lower survival) in a given year.

3.6 Discussion

In this work, we integrated the emerging literature on the strategic role of owners in firm value creation (Foss et al., 2021; Schulze & Zellweger, 2021) with social role theory (Eagly, 1987; Eagly & Karau, 1991; Eagly & Wood, 1991) to theorize how owner teams' *gender composition* affects firm growth and survival. Our results show that firms with a higher percentage of ownership shares held by women are likely to *survive longer* and *grow less*, while the latter is only valid for firms with a small co-owner team. Our work contributes to the limited research on women's entrepreneurship taking a team-level perspective and to the literature on the strategic role of ownership in firm value creation.

3.6.1 Theoretical implications

Our research contributes to the literature on women's entrepreneurship (Jennings & Brush, 2013) in three major ways. First, previous studies have typically applied arguments from role incongruity theory (Eagly & Karau, 2002) to explain how women suffer from reduced access to resources, such as financial capital (Kanze et al., 2018; Liao et al., 2023; Yang & Del Carmen Triana, 2019), which influences their firms' trajectories. For instance, Yang and Del Carmen

Triana (2019) found that ventures led by women owner-managers are more likely to fail partly due to biases against women leaders that make it more difficult for them to lead their teams. We add to this line of research by shifting the focus from a deficit-driven perspective of women owners to a more nuanced picture of how women's *role-congruent* behavior is reflected in (and translates to) different organizational outcomes. In doing so, we challenge the so-called *female underperformance hypothesis* (Du Rietz & Henrekson, 2000; Robb & Watson, 2012; Watson & Robinson, 2003) by pointing to the differential effects of women's ownership on the two most important organizational performance outcomes for private firms (firm growth and survival). Our finding that firms with a higher percentage of ownership shares held by women are more likely to survive (but less likely to grow) is consistent with social role theory, which proposes gender differences in social proclivities and related preferences for growth, risk, and non-financial goals that may lead women to favor survival over growth.

Second, research on women's entrepreneurship incorporating a team-level perspective (Dai et al., 2019; Godwin et al., 2006; Santos & Neumeyer, 2022; Yang & Aldrich, 2014) is surprisingly scarce despite the fact that a substantial number of firms are owned by teams rather than individuals (Ruef, 2010). Thus, we still have limited knowledge about the mechanisms explaining the performance outcomes of teams with different gender compositions and the boundary conditions thereof (cf. the call by Jennings and Brush [2013] to investigate different "types" of entrepreneurial teams with a mix of men and women). In particular, we add to this line of research by discussing the moderating effect of team size (i.e., smaller versus larger teams) as a boundary condition for how gender differences in team decision-making emerge (and interact) in influencing firm growth and survival. In addition, we offer a more granular measurement of women's decision-making authority *via their exact ownership shares* that goes beyond assessing women's involvement and formal positions (vis-à-vis previous research that only considered whether women were defined as leaders in ventures [Yang & Del Carmen Triana, 2019]).

Third, much of the research discussing the implications of mixed-gender teams has focused on higher levels of social sensitivity in teams associated with women's involvement as a key mechanism (Godwin et al., 2006; Hoogendoorn et al., 2013; Lyngsie & Foss, 2017). We extend this scholarly discussion by explaining how women's influence may prevent polarization toward risk in teams dominated by men (Chen et al., 2019; Farh et al., 2020; Isenberg, 1986; Myers & Lamm, 1976) and offer (very early) supportive empirical evidence for the role of firm-level risk-taking as a key explanatory element of our findings. Further, our robustness checks reveal that the relationships between a higher percentage of ownership shares held by women and both firm growth and survival become more positive as the number of men owners increases, suggesting complementarities between women's and men's behavioral tendencies (Tang et al., 2021) that emerge particularly in larger teams. This finding also points to positive effects of women's decision-making authority *across* performance outcomes, which may be fully enabled by access to resources (i.e., access to both different perspectives and access to financing) facilitated by the involvement of men owners, as suggested by Godwin et al. (2006).

Finally, we also contribute to the burgeoning literature on the strategic role of ownership in firm value creation, which, to date, has mostly been bound to theoretical work illuminating how owners' individual characteristics, such as their competence (Foss et al., 2021; Foss et al., 2023), influence firms' value creation. However, despite increasing scholarly attention toward the role of owners' judgment in shaping firm outcomes (cf. Alvarez et al., 2020), we still have limited knowledge about how *owner teams* integrate their potentially divergent judgment regarding resource allocation. We thus direct scholarly attention to the level of *owner teams* and explain how owners' individual beliefs (i.e., their judgment and theories of value, which are supposedly shaped by their gender) converge on key firm-level decision-making outcomes. Importantly, we find that the number of co-owners serves as a boundary condition for the relationship between the percentage of ownership shares held by women and firm value creation (approximated by firm growth and survival in our research). This finding implies that owners'

influence is not proportional to their decision-making authority but depends on the composition of the focal team (i.e., the number and gender of co-owners) and, consequently, likely depends on their interactions with other owners of the firm (cf. Bird & Zellweger, 2018; Foss et al., 2021).

3.6.2 Limitations and avenues for future research

Our research has certain limitations that provide avenues for future research. First, self-selection effects may explain our findings. For instance, women are less likely to self-select into high-growth firms because such firms typically entail longer working hours and less flexibility, both of which do not fit well with women's frequently assumed caretaker role (Faccio et al., 2016; Yang & Aldrich, 2014). While we took several steps to reduce these endogeneity concerns, we cannot fully establish causality in the chosen research setting. This problem is common in research on *private firms* because "natural experiments," as typically leveraged by econometricians (e.g., see Ahern & Dittmar, 2012), are rarely possible for private firms. However, future research could use laboratory experiments of business simulations with groups of firm owners or field data (Apesteguia et al., 2012; Hoogendoorn et al., 2013) to establish causality.

Second, to control for the effect of profitability on firm growth and survival, we restricted our sample to European firms. Accordingly, we acknowledge that the results may differ for other countries, especially developing countries and rural areas (Venkatesh, Shaw, Sykes, Wamba, & Macharia, 2017). Future research might thus attempt to confirm or challenge the generalizability of our findings by focusing on the idiosyncratic characteristics of other settings (e.g., countries or even particular industries [Kalnins & Williams, 2014] and local settings [Kalnins & Williams, 2021]).

Third, we acknowledge that we cannot infer precise team processes from our archival data. While we built our theorizing on well-established and robust differences among men and

women in terms of preferences and behaviors, future research could use additional methods (particularly qualitative methods like interviews and observations) to more deeply investigate the mechanisms underlying our theorizing—polarization to risk and the quality of team interactions.

3.7   Reflection and transition to Chapter 4

Chapter 3 presented a nuanced view of how the gender composition of owner teams—and associated individual and collective preferences for risk and social interaction—influence the growth and survival of private firms. The theorizing in Chapter 3 built primarily on the occurrence of various group processes via different gender compositions (both detrimental [group polarization] and beneficial [critical deliberation] in nature) that shape an owner team's collective cognition and influence entrepreneurial outcomes. Chapter 4 maintains this focus on investigating underlying group processes, but narrows it by focusing explicitly on groupthink as a group dynamic associated with escalation of commitment. Similar to Chapter 2, Chapter 4 refers to strong social ties (here: friendship ties) as an important structural feature influencing group interactions, especially groupthink. It also introduces the distribution of power as an additional structural feature that facilitates the emergence of groupthink.

4 Keep your thoughts to yourself: Entrepreneurial team's structure and the escalation of commitment to a failing venture[26]

4.1 Introduction

Escalation of commitment—decision-makers' tendency to persist with failing courses of action (Brockner, 1992; Staw, 1976, 1981; Staw & Ross, 1978)—is common in the entrepreneurial context (Baron, 1998; DeTienne et al., 2008; Gimeno et al., 1997; Holland & Shepherd, 2013; McCarthy et al., 1993). Indeed, entrepreneurs' escalation of commitment is exacerbated by the inherent uncertainty of entrepreneurial action (McMullen & Shepherd, 2006), the high risk and costs of venture failure (Shane, 2008), and the personal responsibility of entrepreneurs for their ventures' performance (Shepherd, Wiklund, & Haynie, 2009). Therefore, entrepreneurs are typically emotionally attached and committed to their ventures' success, which can lead them to escalate their commitment if their ventures are failing (Kier et al., 2022). This phenomenon is problematic because escalation of commitment to a failing venture can be costly to the entrepreneur (McCarthy et al., 1993) and to other stakeholders, such as employees, investors (DeTienne et al., 2008; Guler, 2007; Ruhnka et al., 1992; Shepherd, Patzelt, Williams, & Warnecke, 2014), and society (McGrath, 1999).

While examples of individuals' escalation of commitment are well documented in the literature (see Sleesman et al., 2012 for a review), research on the group (team) level is limited (Bazerman et al., 1984; Keil & Mähring, 2010; Sleesman et al., 2018; Whyte, 1993) and is exceptionally scarce in the context of *entrepreneurial teams* (Huang et al., 2019; Kier et al., 2022). This gap is surprising given that ventures are founded mainly by entrepreneurial teams

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(Ruef, 2010), in which all team members are involved in their ventures' strategic decisions (Knight et al., 2020; e.g., whether and how to persist) and in which group dynamics can exacerbate or attenuate individual members' cognitive biases (Hinsz, Tindale, & Nagao, 2008; Janis, 1972; Kerr & Tindale, 2004; Myers & Lamm, 1976; Sunstein & Hastie, 2014). Therefore, it is important to understand why some entrepreneurial teams escalate their commitment to a failing venture while others are less likely to do so (e.g., they instead terminate a failing venture).

While teams have the potential to incorporate team members' diverse viewpoints and perspectives to make more informed decisions (Kilduff, Angelmar, & Mehra, 2000; Van Knippenberg & Mell, 2016; Van Knippenberg & Schippers, 2007), they are still vulnerable to escalation of commitment (Bazerman et al., 1984; Roberto, 2002; Whyte, 1993). Examples of group escalation of commitment include tragic incidents, such as the deaths of five climbers on a Mount Everest excursion in 1996 who continued their ascent despite dangerous weather changes (McMullen & Kier, 2016; Roberto, 2002); project teams' persistence with failing new product development projects (Keil & Mähring, 2010; Van Oorschot, Akkermans, Sengupta, & Van Wassenhove, 2013); and the Bristol Royal Infirmary management team's entrapment in a low-performing surgery program (Weick & Sutcliffe, 2003). These examples show that teams often fall prey to groupthink (i.e., extreme concurrence-seeking tendencies in groups; cf. Janis, 1972), thereby suppressing individual members' critical thoughts and failing to reexamine alternatives to the action taken.

Inspired by the literature on groupthink (Isenberg, 1986; Janis, 1971, 1972; Janis & Mann, 1977) and escalation of commitment (Ross & Staw, 1986; Staw, 1976, 1981; Staw & Ross, 1978), we theorize that structural features of entrepreneurial teams (or the team design, cf. Stewart, 2006) can contribute to these teams' escalation of commitment. In particular, we focus on *friendship ties* and teams' *power distribution* because both are critical antecedents to groupthink and are important research areas in the burgeoning literature on entrepreneurial team

formation (see Lazar et al., 2020 for a recent review). Specifically, entrepreneurial team members often select their co-founders based on friendship ties (Francis & Sandberg, 2000; Lazar et al., 2022; Ruef et al., 2003). Moreover, an entrepreneurial team can either distribute the power equally or unequally (Certo et al., 2001; Ensley et al., 2000; Grossman et al., 2012).

Specifically, we theorize and test how entrepreneurial teams' structure and structure-induced team processes and beliefs impact their escalation of commitment to a failing venture. We conducted four experiments to test our models. Studies 1 and 2 used face-to-face experiments with 69 teams of three entrepreneurship students. In Studies 3 and 4, we used randomized online experiments to portray active entrepreneurs as founders of a failing venture and provided them with information about their respective team's structure. The four studies provided strong empirical support for the theorized relationships.

Our research contributes to the literatures on entrepreneurial team formation, entrepreneurial biases, and general group escalation. First, we contribute to the literature on entrepreneurial team formation (Francis & Sandberg, 2000; Lazar et al., 2020; Lazar et al., 2022) by providing evidence that structural features, such as team members' friendship ties and the power distribution in the team, impact team cognition—the collective thinking and ability to process critical knowledge (West III, 2007). We theorize and find that different features of a teams' structure induce distinct team beliefs and processes that can limit team members' critical re-examination of alternatives to continuing with a failing venture. Importantly, we show that friendship ties and an unequal power distribution among team members, both of which appear to facilitate coordination and decision-making (Francis & Sandberg, 2000; Halevy, Chou, & Galinsky, 2011; Lazar et al., 2022), can also have a dark side—the escalation of commitment to a failing venture.

Second, we contribute to the literature on entrepreneurial biases, which has mostly explored cognitive biases at the individual level (Zhang & Cueto, 2017) and includes only a few studies at the team level (notable exceptions are Houghton et al., 2000; Huang et al., 2019).

We extend prior research by explaining how the emergence of team-level biases and the exacerbation of individual biases in the team context depend on entrepreneurial teams' structure (Hinsz et al., 2008; Kerr & Tindale, 2004).

Finally, we contribute to the broader literature on group escalation of commitment (Bazerman et al., 1984; Thompson, Kray, & Lind, 1998; Whyte, 1993) by answering calls to understand how group composition and group processes affect group escalation of commitment (Sleesman et al., 2018). We add to this research by pointing to friendship ties and the power distribution as two *structural group features* that help explain why some groups escalate commitment more than others.

4.2 Theoretical foundations

4.2.1 Entrepreneurial teams' escalation of commitment

The importance of escalation of commitment—individuals' tendency to commit to a failing course of action after receiving negative feedback (Staw, 1976, 1981; Staw & Ross, 1978) despite high uncertainty about whether the chosen path will be successful (Brockner, 1992)—is widely acknowledged in the entrepreneurial context (Åstebro, Jeffrey, & Adomdza, 2007; Baron, 1998; Holland & Shepherd, 2013; Kier et al., 2022; Shepherd, Souitaris, & Gruber, 2021). Its importance can be attributed to the fact that entrepreneurs are exceptionally prone to escalate their commitment due to their strong personal commitment to their ventures; their public image being at risk; and substantial sunk costs, such as significant investments of time and money (Baron, 1998; Kier et al., 2022; McCarthy et al., 1993).

However, empirical evidence on the antecedents of escalation of commitment in the entrepreneurial context remains scarce, especially at the team level. At the individual level, there is evidence that overconfident founding entrepreneurs (McCarthy et al., 1993) and entrepreneurs who made large investments into their ventures (DeTienne et al., 2008) are more likely to escalate their commitment to a failing venture. Also, there is evidence that

entrepreneurs' decisions to persist depend on their personal values, such as their openness to change (see Holland & Shepherd, 2013). Focusing on the team level, Huang et al. (2019) further investigated the effect of collectively felt emotions (i.e., hope as a driver and fear as an inhibitor) on entrepreneurial teams' escalation of commitment using a sample of 66 teams of business students in the United Kingdom who participated in a computer simulation of a new venture. Interestingly, the authors found early (non-hypothesized) evidence of a positive relationship between friendship ties and escalation of commitment and called for a better understanding of how entrepreneurial teams' structure influences their escalation of commitment.

4.2.2 Groupthink, teams' structure, and entrepreneurial teams' escalation of commitment

Generally, groups deliver better decision quality than individuals because multiple perspectives can be considered in the decision-making process (Kerr & Tindale, 2004). However, this group advantage requires the presentation and discussion of individually held information (Zellmer-Bruhn, Maloney, Bhappu, & Salvador, 2008) and the integration of the different information pieces to reach a decision (Dreu, Nijstad, & Van Knippenberg, 2008; Nijstad & Dreu, 2012), which is not always the case. Group information processing (Dreu et al., 2008; Hinsz, Tindale, & Vollrath, 1997), particularly incorporating critical perspectives, seems distorted in decisions related to escalation of commitment. The reason for this distortion is that an individual's arguments favoring escalation of commitment tend to carry more weight in discussions, while an individual's critical arguments against such escalation are often insufficiently shared or integrated within a group due to group dynamics, such as groupthink (Bazerman et al., 1984; Whyte, 1993, 1998). Therefore, although groups often have a potential informational advantage (i.e., greater access to information and knowledge) and should thus be less likely to escalate their commitment, some groups are even more likely to escalate their commitment than individuals (Bazerman et al., 1984; Whyte, 1993).

The phenomenon of groupthink (Janis, 1972) explains why groups sometimes make dysfunctional decisions. Groupthink describes the tendency toward extreme concurrence seeking in some groups, with group members striving for unanimity (Janis, 1972; Leana, 1985; Whyte, 1998). As Janis (1971: 84) noted, "The symptoms of groupthink arise when the members of decision-making groups become motivated to avoid being too harsh in their judgments of their leaders' or their colleagues' ideas". Symptoms of groupthink include an overestimation of the group, closed-mindedness (e.g., group members collectively rationalize former choices), and uniformity pressures (e.g., group members keep critical thoughts to themselves to maintain the group's unanimity) (Haslam, Ryan, Postmes, Spears, Jetten, & Webley, 2006; Janis, 1972; Janis & Mann, 1977; Whyte, 1998). Due to these symptoms, groups fail to derive a complete set of alternatives and objectives, fail to examine the risks of the preferred choice, and engage in poor-quality information search (Janis, 1972). All of these factors increase groups' propensity to escalate commitment.

In discussing the antecedents of groupthink, Janis (1972) emphasized group cohesiveness, faults in groups' organizational structure (e.g., directive leadership or lack of norms for decision procedures), and the situational context (e.g., stressful external threats) (Janis, 1972; Janis & Mann, 1977). Based on this description, entrepreneurial teams are generally prone to experiencing groupthink because (1) entrepreneurial team members usually constitute a cohesive interdependent entity (Ensley, Pearson, & Amason, 2002; Knight et al., 2020), (2) entrepreneurial teams operate under uncertainty (McMullen & Shepherd, 2006) often without established norms for decision procedures, and (3) anticipating venture failure poses a stressful threat given teams' high level of personal responsibility for their ventures (Shepherd et al., 2009). We propose that certain features of a team's structure—namely, friendship ties and an unequal power distribution within the team—likely make groupthink and, ultimately, escalation of commitment to a failing venture even more likely. We note that while these two structural features could be correlated (i.e., friends are more likely to distribute power equally

when founding a team), the two features are conceptually distinct: despite being friends, team members could also have different power levels in an entrepreneurial team related to their contributions to the venture, their equity positions, their age, and/or their status.

4.3 Hypothesis development

4.3.1 Friendship ties and entrepreneurial teams' escalation of commitment

Friendship ties are common in entrepreneurial teams because founders often select their team members based on homophily and strong ties (Lazar et al., 2022; Ruef et al., 2003; Ruef, 2010). Friendship ties offer substantial benefits to teams, such as enhanced levels of information sharing and reciprocity (Granovetter, 1973) and improved coordination of complementary tasks (Francis & Sandberg, 2000; Lazar et al., 2022). However, friendship ties are also associated with a higher likelihood of information redundancies (Ruef, 2010) and hence lower diversity in opinions when making strategic decisions (Kilduff, 1990). Against this background, we note that the relationship between friendship ties in an entrepreneurial team and escalation of commitment to a failing venture is unclear. For instance, in the context of public firms, friendship ties among directors of a corporate board increase these directors' open expression of concerns about the focal firm's strategy, *alleviating* the firm's likelihood of escalating commitment (Westphal & Bednar, 2005). However, CEOs who overly rely on friends when making strategic decisions *increase* their firms' likelihood of escalating commitment (McDonald & Westphal, 2003).

Emotions may help explain how friendship ties in entrepreneurial teams impact escalation of commitment to a failing venture (Francis & Sandberg, 2000; Huang et al., 2019). For instance, ventures' lack of financial success might be compensated for by psychic income in groups entailing strong friendship ties (Huang et al., 2019). Also, the psychological costs of "leaving friends" often counteracts venture termination (Dahlander & McFarland, 2013; Francis & Sandberg, 2000). Indeed, due to their strong emotional attachments to their friends,

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team members of a new venture entailing friendship ties may be less motivated to carefully analyze why terminating the venture may be the superior alternative to escalating the investment of resources in the venture's current course of action. This amicable atmosphere may lead teams of friends to be excessively optimistic and risk taking, a prediction consistent with groupthink theory.

Indeed, group dynamics, such as pressure toward social conformity (i.e., groupthink), are likely to emerge in cohesive teams (e.g., "friendship cliques"; cf. Janis, 1971: 84) in which members feel strongly affiliated with each other and the respective group (Thompson et al., 1998). While, in theory, strong emotional bonds and interpersonal trust among co-founders (Francis & Sandberg, 2000; Gibbons, 2004) could increase the open expression of critical thoughts (Westphal & Bednar, 2005), friends are likely to avoid being too critical to preserve the positive "we-feeling" of a team (cf. Janis, 1971). As McMullen and Kier (2016) noted, team members' motivational alignment—typical for friends—can lead to non-deliberate and maladaptive decision-making that promotes escalation of commitment. This maladaptive decision-making is also consistent with the observation that dedicated project teams working in complex and uncertain environments unconsciously filter out negative information (cf. Van Oorschot et al., 2013), hindering them from terminating projects when needed. Moreover, teams consisting of friendship ties are likely to be more focused on the shared perspective of what they can accomplish (Stasser & Titus, 1985), which could lead them to overestimate their agency (to turn a failing venture around) and increase their willingness to take risks (Janis, 1972; Whyte, 1998). Consequently, this excessively optimistic evaluation of a venture's situation increases their likelihood of escalating commitment to the respective failing venture. Based on the above reasoning, we offer the following hypothesis:

> **Hypothesis 1a.** *Entrepreneurial teams with stronger friendship ties are more likely to escalate their commitment to a failing venture than those with weaker friendship ties.*

The main mechanism for the positive relationship between friendship ties and escalation of commitment—namely, teams' overestimation of their ability—can be captured by the *measurable* construct of collective efficacy (e.g., Lent, Schmidt, & Schmidt, 2006; Thompson et al., 1998). Collective efficacy is defined as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (Bandura, 1997: 477) and has been associated with lower vigilance, enhanced risk seeking, and escalation of commitment (Sleesman et al., 2018; Tasa & Whyte, 2005; Whyte, 1998). Accordingly, we offer the following mediation hypothesis (see Figure 7 for full conceptual model):

> **Hypothesis 1b.** *The positive relationship between friendship ties within entrepreneurial teams and escalation of commitment to a failing venture is mediated by the teams' collective efficacy. Specifically, there is a positive relationship between friendship ties within entrepreneurial teams and the teams' collective efficacy and a positive relationship between the teams' collective efficacy and their escalation of commitment to a failing venture.*
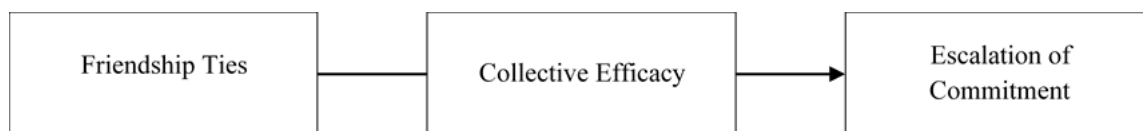
Figure 7. Conceptual model for studies 1 and 3 (friendship ties)

4.3.2 Power distribution and entrepreneurial teams' escalation of commitment

The power distribution within teams influences their decision-making and performance by altering how team members interact and work together (e.g., Halevy et al., 2011). Power in an organizational context is defined as an individual's legitimate right to exert influence over other members of the organization (i.e., structural power) (Hambrick, 1981). Sense of power is also considered a psychological state that determines individuals' behavior in team interactions (Galinsky, Gruenfeld, & Magee, 2003; Tost et al., 2013). In general, an unequal power distribution within a team (i.e., one or some team members having more power than others) can

be beneficial because it facilitates coordination among team members and eases decision-making (e.g., Ronay, Greenaway, Anicich, & Galinsky, 2012). Also, more powerful team members may feel socially responsible for less powerful team members (Tost & Johnson, 2019). However, unequal power distributions within teams can also lead to the emergence of power struggles among team members (Anderson & Brown, 2010), disincentives for cooperation (Siegel & Hambrick, 2005), and self-censorship by less powerful team members (e.g., Edmondson, 2003).

In the entrepreneurial context, we theorize that teams with an unequal power distribution likely fall prey to groupthink and escalate their commitment to a failing venture. We theorize (1) that more powerful team members advocate strongly for the continuation of a venture and (2) that their dominant behavior in team discussions imposes a barrier to other team members dissenting, ultimately exacerbating these entrepreneurial teams' escalation of commitment. Specifically, individuals who *feel powerful* tend to be more optimistic and take more risks (e.g., Anderson & Galinsky, 2006), which likely increases their propensity to escalate. Moreover, the status and reputation of powerful team members are more closely tied to the success of the venture because they have more decision-making authority. This importance relative to other team members makes them more likely to escalate their commitment to the venture, since terminating the venture could be perceived as an admission that previous venture-related decisions were wrong.

Meanwhile, less powerful team members may feel inhibited from participating in the decision-making process (Dreu & West, 2001), especially when it comes to voicing critical opinions on why terminating a failing venture may be the better alternative to persistence (Anderson & Berdahl, 2002; Anderson & Kilduff, 2009; Gray, Bunderson, Van der Vegt, Rink, & Gedik, 2023; Gruenfeld, Inesi, Magee, & Galinsky, 2008). This is because more powerful team members tend to verbally dominate team discussions (Tost et al., 2013), often do not accept the advice of other team members (See, Morrison, Rothman, & Soll, 2011; Tost, Gino,

& Larrick, 2012), and typically do not try to understand other perspectives (Galinsky, Magee, Inesi, & Gruenfeld, 2006). Consequently, this situation undermines the task conflict (Edmondson, 2003) necessary to make an informed decision (Hinsz et al., 2008).

In sum, we propose that teams with an unequal power distribution are more likely to escalate their commitment to a failing venture due to uniformity pressures (Janis, 1972) created by the interplay of powerful team members' dominance in discussions and less powerful team members' reluctance to voice critical, potentially important perspectives (Edmondson, 1999; Edmondson, 2003). Based on the above reasoning, we offer the following hypothesis:

> **Hypothesis 2a.** *Entrepreneurial teams with an unequal power distribution are more likely to escalate their commitment to a failing venture than teams with an equal power distribution.*

The main mechanism of our theorizing above—uniformity pressures within an entrepreneurial team—can be captured by the *measurable* construct of task conflict. Task conflict describes disagreements between team members based on different opinions about a task (Jehn, 1995). These disagreements can enhance decision-making by stimulating critical thinking (Jehn, 1995; Schulz-Hardt et al., 2002) and challenging the dominant view. We propose that in teams with an unequal power distribution, the dominant—escalating commitment—view is reinforced through limited task conflict because less powerful team members refrain from voicing their dissent. Therefore, we offer the following hypothesis:

> **Hypothesis 2b.** *The positive relationship between an unequal power distribution within entrepreneurial teams and escalation of commitment to a failing venture is mediated by the teams' task conflict. Specifically, an unequal power distribution within entrepreneurial teams is negatively related to the teams' task conflict, and the teams' task conflict is negatively related to the teams' escalation of commitment to a failing venture.*

4.3.3   The moderating effect of psychological safety

The above theorizing assumes that more powerful team members do not encourage critical deliberation from less powerful team members, for example, in an open discussion of disagreement with the dominant position (Janis, 1971). However, whether critical perspectives

are voiced likely depends on the psychological safety of a team (Bradley, Postlethwaite, Klotz, Hamdani, & Brown, 2012; Edmondson, 1999). Psychological safety is the "sense of confidence that the team will not embarrass, reject, or punish someone for speaking up" (Edmondson, 1999: 354). It mitigates the uniformity pressures in a team and enables all team members to contribute their critical viewpoints to discussions. Psychological safety appears to be an important moderator of the relationship between teams' structure and decision quality (Gibson & Gibbs, 2006; Martins, Schilpzand, Kirkman, Ivanaj, & Ivanaj, 2013) and is critical when teams face uncertainty and complexity (Edmondson & Lei, 2014). Indeed, uncertainty and complexity are inherent to the entrepreneurial process (Koudstaal, Sloof, & van Praag, 2016). In teams with psychological safety, team members perceive less risk in speaking up to team members in higher power positions (Edmondson, 2003), which may allow such teams to harness task conflict (Bradley et al., 2012) and avoid (or minimize) escalation of commitment to a failing venture. Therefore, we offer the following hypothesis (see Figure 8 for full conceptual model):

Hypothesis 2c. *The positive effect of an unequal power distribution within entrepreneurial teams on their escalation of commitment to a failing venture is weakened for higher levels of psychological safety in teams.*
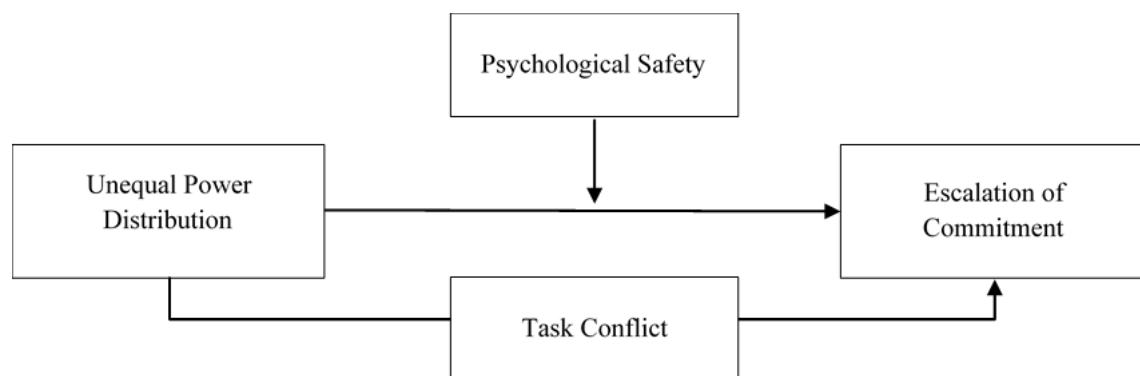
Figure 8. Conceptual model for studies 2 and 4 (power distribution)

4.4 Research method

In line with recent recommendations (Williams, Wood, Mitchell, & Urbig, 2019), we conducted four randomized experiments to test our hypotheses: face-to-face experiments with teams of entrepreneurship students and online experiments with real entrepreneurs. In all four studies, we manipulated either the strength of friendship ties or the power distribution in the teams to test the effect of entrepreneurial teams' structure on their escalation of commitment (through our theorized groupthink symptoms) in a hypothetical scenario of a failing venture. Our face-to-face experiments provide *internal validity* for our findings because our manipulations and measures are realistic and based on information about the participants' real lives. The subsequent online experiments relied on a vignette-based factorial survey approach (Rossi & Anderson, 1982) and provide *ecological validity* (Hsu et al., 2017) for our findings as they confirm that the results of our first two studies hold for actual entrepreneurs.

In all four experiments, we made use of a case vignette originally introduced by Arkes and Blumer (1985), which has been widely used in research studying escalation of commitment (e.g., Conlon & Garland, 1993; Kier et al., 2022). We adapted this vignette to the context of a failing new venture. To ensure comparability across all studies, we used the same scenario and, when possible, the same measurements for relevant variables. The case is described below and was slightly adapted for the online experiments (see Studies 3 and 4 for more information):

> *You are part of a start-up. Your start-up invested 10 out of 12 million euros of the start-up's money into the development of a new product—a plane that cannot be detected by a conventional radar, in other words, a radar-blank plane. When the project is 50% completed, another firm begins marketing a plane that cannot be detected by radar. In addition, it is apparent that their plane is much faster and far more economical than the plane your start-up is building. You have the possibility to use the remaining 2 million euros of your start-up's money and you have an offer for a loan for another 5 million euros that would allow your team to continue further. Failure of the project will result in your start-up going bankrupt.*

We start with elaborating on the face-to-face experiments, in which we manipulated the strength of friendship ties (Study 1) and the power distribution (Study 2) in teams.

4.5 Study 1—Manipulation of friendship ties (Face-to-face experiment)

4.5.1 Participants and design

We collected data from students in two entrepreneurship courses at a German university in 2021 and 2022, and students received bonus points for their exams for participating in the study. In total, 96 international entrepreneurship students (i.e., 32 teams consisting of three entrepreneurship students each) participated as part of an in-class exercise. We employed one between-subjects factor (*stronger friendship ties* versus *weaker friendship ties*). We maximized or minimized the strength of friendship ties within each team (dependent on the condition) based on the results of a social network analysis that all the students conducted in an unrelated task before the experiment. A main advantage of the classroom setting is that we were able to gather knowledge about the students' social ties before conducting the study and realistically manipulate the teams' structure (see also Lazar et al., 2022). We also note that our sample size (i.e., more than 30 teams) is relatively high compared to previous studies conducting laboratory experiments with teams (e.g., Tost et al. [2013] relied on data from 20 teams in an experiment with one between-subject factor).

4.5.2 Procedure

To ensure the students experienced psychological realism, they worked with their real friends (or with non-befriended students). To randomly assign the participants, we took the following steps: First, we collected data on the students' friendship ties by having them conduct a social network analysis in an unrelated task around two weeks before the experiment (for a similar procedure, see Lazar et al., 2022). In the social network analysis, each student categorized other students from the class into three categories, indicating a closer or less close relationship for each student. Second, before allocating the teams, we randomly assigned each student to either the stronger or weaker friendship ties condition. Finally, within these conditions, we formed teams of three students and either matched the students with other students with whom they

reported a close relationship (stronger friendship ties condition) or matched them with other students with whom they reported infrequent contact (weaker friendship ties condition).

Afterward, we asked the teams to discuss the case of the failing venture for a maximum of 10 minutes with the stated goal of collectively indicating the probability they would want to continue the project (i.e., the venture) in the end. We also assessed participants' demographic characteristics before the case discussion and all relevant outcome variables right after the case discussion. To ensure the students took the task seriously, we offered private career coaching for team members who provided a well-derived justification of their choice on whether or not to continue the venture. As we offered coaching only for the best team, winning the prize was possible but rare, reflecting entrepreneurial reality (Huang et al., 2019).

4.5.3 Measures

Unless otherwise noted, all scale items were measured on a seven-point Likert scale (ranging from "1 = strongly disagree" to "7 = strongly agree"). Items comprising one scale were averaged into a single score and finally aggregated to the team level. We obtained the Cronbach's alphas for the scales (reported below) before aggregating the data to the team level, meaning that we calculated them based on individuals' answers, not teams' answers.

Manipulation check. We followed Huang et al. (2019) to check whether our manipulation was successful. We let the students indicate how they would describe their relationships with the other two team members (in real life) (rated on a five-point Likert scale ranging from "1 = acquaintance" to "5 = very close friend").

Escalation of commitment. We employed the teams' collective indication of their propensity to continue the project and escalate commitment as a measure of escalation of commitment using the following question: "How likely is it that your group would continue with the project (as a percentage ranging from 0 to 100)?" To create an alternative dependent variable, we also asked the students to indicate whether their teams would continue the project

and escalate commitment with a yes/no question. We created a dummy variable equaling 1 if the teams indicated they would continue the venture and 0 if they indicated they would terminate the venture.

Collective efficacy. To measure the teams' collective efficacy, we adapted items Zhao, Seibert, and Hills (2005) developed to the team level. We used six items asking the participants to indicate their teams' level of competence in performing the following tasks: "identifying new business opportunities"; "creating new products and services"; "managing innovation within a business"; "building up a professional network"; "commercializing a new idea or development"; and "successfully managing a business" (rated on a seven-point Likert scale ranging from "1 = very low competence" to "7 = very high competence") ($\alpha = 0.86$).

Control variables. We controlled for the teams' mean risk propensity using five items by Zhang, Highhouse, and Nye (2019). The items were "Taking risks makes life more fun"; "My friends would say that I'm a risk taker"; "I enjoy taking risks in most aspects of my life"; "I am a believer of taking chances"; and "I am attracted, rather than scared, by risk" (see also Keh et al., 2002) ($\alpha = 0.91$). Further, we controlled for the teams' mean age (measured in number of years), gender diversity (employing a blau index, cf. Blau, 1977), and mean entrepreneurial experience (measured in number of months).

4.5.4 Results

Table 10 reports the means and standard deviations of the variables used in the analysis, separately for both conditions, and provides the results of t-tests for group differences for all the variables. Table 11 reports pairwise correlations for all the variables.

Table 10. T-tests for dependent variable, mediator, manipulation check, and control variables (Study 1)

Variable	Low Level of Friendship Ties			High Level of Friendship Ties				
	Mean1	SD1	N1	Mean2	SD2	N2	t-value	p-value
Escalation of Commitment	51.33	31.22	15	83.06	15.54	17	**-3.71**	**0.00**
Escalation (Yes/No)	0.53	0.52	15	0.94	0.24	17	**-2.92**	**0.01**
Friendship Ties (Check)	2.06	0.60	15	3.21	0.97	17	**-3.97**	**0.00**
Collective Efficacy	4.80	0.76	15	5.51	0.67	17	**-2.83**	**0.01**
Mean Age	22.44	2.84	15	22.43	2.77	17	0.01	0.99
Blau Index Gender	0.24	0.23	15	0.26	0.23	17	-0.30	0.76
Mean Entrepreneurial Exp.	1.87	2.14	15	3.04	3.60	17	-1.19	0.28
Mean Risk Propensity	4.98	0.69	15	5.18	0.74	17	-0.80	0.43

Table 11. Pairwise correlations of included variables (Study 1)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Escalation of Commitment	1.000						
(2) Friendship Ties (0/1)	0.561*	1.000					
(3) Collective Efficacy	0.698*	0.459*	1.000				
(4) Mean Age	-0.132	-0.002	0.020	1.000			
(5) Blau Index Gender	0.026	0.055	-0.237	0.049	1.000		
(6) Mean Entrepreneurial Exp.	0.045	0.197	0.204	0.103	-0.158	1.000	
(7) Mean Risk Propensity	0.099	0.144	0.177	-0.206	0.078	0.264	1.000

Correlations marked with * are significant at p < .05 or lower

Manipulation check. We started by examining whether the manipulation was successful. A statistically significant difference between the stronger friendship ties condition (Mean = 3.21; SD = 0.97) and the weaker friendship ties condition (Mean = 2.06; SD = 0.60; t = -3.97; $p < 0.001$) indicated that our manipulation worked. As displayed in Table 10, teams across the conditions did not have statistically significant differences in their gender composition, mean age, entrepreneurial experience, or risk propensity.

Escalation of commitment. We found higher escalation of commitment to a failing venture in the stronger friendship ties condition (Mean = 83.06; SD = 15.54) compared to the weaker friendship ties condition (Mean = 51.33; SD = 31.22), and the difference was statistically significant (t = -3.71; $p < 0.001$). This finding supports Hypothesis 1a.

Mediating effect of collective efficacy. To test the mediating effect of collective efficacy, we employed bootstrap analysis to derive bias-corrected confidence estimates based on 5,000 random samples with replacement from the total sample (Shrout & Bolger, 2002). We included all the control variables as covariates. The confidence interval for the indirect effect

($\beta_{a \times b}$ = 16.24, SE 8.30) did not include zero (95% CI [3.54 to 37.12]), offering support for Hypothesis 1b.

4.5.5 Robustness check

To check the robustness of our results, we first checked whether our results held for the alternative specification of our dependent variable (i.e., the binary choice: continue versus terminate). Our results remained robust, with 94.12% (SD = 24.25%) of the teams in the stronger friendship ties condition and 53.33% (SD 51.64%; t = -2.92, $p < 0.01$) of the teams in the weaker friendship ties condition indicating that they would continue the project. We report some exploratory tests with an alternative specification of our mediator in Chapter 8.3.1 in Appendix C, which also support our general theorizing and findings.

4.5.6 Discussion of Study 1

The results of Study 1 support our argument that entrepreneurial teams sharing friendship ties are more likely to escalate their commitment to a failing venture and that the effect is mediated by higher levels of collective efficacy in teams, which we relate to the groupthink symptom of teams' overestimation. We now turn to the second face-to-face experiment, in which we manipulated the power distribution in teams.

4.6 Study 2—Manipulation of power distribution (Face-to-face experiment)

4.6.1 Participants and design

For our second study, we collected data from students in another set of entrepreneurship courses at a German university in 2022. This time, students received financial compensation of 10 euros for their participation. One hundred and eleven international entrepreneurship students (i.e., 37 teams consisting of three students each) participated in the experiment as part of a class exercise. The study employed one between-subjects factor (unequal power distribution versus equal power distribution). We randomly assigned the students to teams of three and then to one of the two conditions. In the unequal power distribution condition, we randomly selected a

student from each team to serve as the "team leader" who also received a manipulation inducing a subjective sense of power. Again, we note that the manipulation for this study would be more difficult to conduct with real entrepreneurs as their behavior in such an experiment would be confounded by developments in their ventures (e.g., a founder-CEO of a new venture would be unlikely to engage in a low-power role in an experiment) (Hsu et al., 2017; Kier et al., 2022).

4.6.2 Procedure

The power manipulation was embedded in briefing materials that each student received after the team allocation. In the unequal power distribution condition, we told one student to serve as the team leader, who would play a coordinating role and was responsible for writing down the team's decision at the end (e.g., Bunderson, Van der Vegt, Cantimur, & Rink, 2016). We told the other two team members to serve as regular team members. Following Tost et al. (2013), we had the students visibly wear nametags on their shirts (stating either "LEADER" or "TEAM MEMBER") to make the power differences more salient. In the equal power distribution condition, the briefing materials stated that there was no leader on the team and that the students should all serve as team members who had to make a decision together. Accordingly, all of these members wore nametags on their shirts stating "TEAM MEMBER".

Tost et al. (2013) pointed out that leaders' structural power only produces patterns of verbal dominance when powerful team members experience a psychological state of power. Therefore, we primed a psychological state of power for all teams' designated leaders. To do so, we used a well-established writing task (e.g., Anderson & Galinsky, 2006; Galinsky et al., 2003) embedded in the first questionnaire, which we masked as a pretest for another (unspecified) study. The writing task (allocated to the assigned leaders in the unequal power distribution condition only) asked the students to think about a situation in which they had power over another person:

> *Please think about a time when you had power over someone. By power, we mean a situation in which you controlled the ability of another person or persons to get something they wanted or were in a position to evaluate those individuals. Please write 4–5 sentences describing this situation in which you had power.*

As in Study 1, after we randomly allocated the students to teams, the teams engaged in a 10-minute discussion to determine whether or not to continue with the focal venture.

4.6.3   Measures

Unless otherwise noted, all scale items were measured on a seven-point Likert scale (ranging from "1 = strongly disagree" to "7 = strongly agree"). We obtained the Cronbach's alphas for the scales (reported below) before aggregating the data to the team level, meaning that we calculated them based on individuals' answers, not teams' answers.

Manipulation check. To check whether our manipulation was successful, we used a scale by Tost et al. (2013) and asked the students to indicate the amount of power they felt during the discussion with two items: "I felt very much influence over the team during the situation" and "I felt very much power during the situation" ($\alpha = 0.90$).

Escalation of commitment. We used the teams' collective indication of their likelihood of continuing the venture and escalating commitment as a measure of escalation of commitment: "How likely is it that your team would continue with the project (as a percentage ranging from 0 to 100)?" We also employed a yes/no question as an alternative dependent variable, creating a dummy variable equaling 1 if the teams indicated they would continue the project and escalate commitment and 0 otherwise.

Task conflict. We asked the participants to indicate the amount of task conflict they experienced throughout the task using four items developed by Jehn (1995). Scale items were "How often do people in your team disagree about opinions regarding the work being done?": "How frequently are there conflicts about ideas in your team?"; "How much conflict about the work you do is there in your team?"; and "To what extent are there differences of opinion in your team?" (rated on a seven-point Likert scale with anchors adapted for each question) ($\alpha = 0.89$).

Psychological safety. We used seven items by Edmondson (1999) to assess the teams' psychological safety. The items were "If you make a mistake on this team, it is often held against you (R)"; "Members of this team are able to bring up problems and tough issues"; "People on this team sometimes reject others for being different (R)"; "It is safe to take a risk on this team"; "It is difficult to ask other members of this team for help (R)"; "No one on this team would deliberately act in a way that undermines my efforts"; and "Working with members of this team, my unique skills and talents are valued and utilized." ($\alpha = 0.77$).

Control variables. We measured a team's mean risk propensity using the same five items as in Study 1 ($\alpha = 0.87$). Again, we controlled for a team's mean age, gender diversity, and mean level of entrepreneurial experience (see Study 1).

4.6.4 Results

Table 12 reports the means and standard deviations of the variables used in the analysis, separately for both conditions, and provides the results of t-tests for group differences for all the variables. Table 13 reports pairwise correlations for all the variables.

Table 14 shows the outputs from an ordinary least squares regression testing the moderating effect of psychological safety.

Table 12. T-tests for dependent variable, mediator, and control variables (Study 2)

Variable	Equal Power Distribution			Unequal Power Distribution				
	Mean1	SD1	N1	Mean2	SD2	N2	t-value	p-value
Escalation of Commitment	52.02	28.03	18	81.63	25.41	19	**-3.37**	**0.00**
Escalation (Yes/No)	0.61	0.50	18	0.89	0.32	19	**-2.07**	**0.05**
Task Conflict	3.28	1.06	18	2.44	0.76	19	**2.77**	**0.01**
Mean Age	20.07	1.54	18	20.82	2.95	19	-0.96	0.34
Blau Index Gender	0.22	0.23	18	0.28	0.22	19	-0.79	0.43
Mean Entrepreneurial Exp.	1.50	2.19	18	1.30	2.03	19	0.29	0.77
Mean Risk Propensity	4.94	0.67	18	4.83	0.76	19	0.46	0.65

Table 13. Pairwise correlations of included variables (Study 2)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Escalation of Commitment	1.000							
(2) Unequal Power Distribution (0/1)	0.495*	1.000						
(3) Psychological Safety	-0.074	-0.082	1.000					
(4) Task Conflict	-0.397*	-0.424*	-0.096	1.000				
(5) Mean Age	0.127	0.161	-0.036	0.009	1.000			
(6) Blau Index Gender	-0.051	0.133	-0.041	-0.090	0.078	1.000		
(7) Mean Entrepreneurial Exp.	0.225	-0.049	0.073	0.208	0.130	0.000	1.000	
(8) Mean Risk Propensity	0.057	-0.077	-0.098	0.059	0.111	-0.296	0.127	1.000

Correlations marked with * are significant at p < .05 or lower

Table 14. Moderating effect of psychological safety (Study 2)

Variable	Escalation of Commitment	Escalation of Commitment
Mean Age	0.222	0.620
	(1.987)	(1.846)
Blau Index Gender	-15.702	-22.117
	(21.660)	(20.221)
Mean Entrepreneurial Exp.	3.618	3.298
	(2.233)	(2.071)
Mean Risk Propensity	0.918	-0.631
	(6.976)	(6.488)
Psychological Safety	-2.193	31.346+
	(7.672)	(15.416)
Unequal Power Distribution (0/1)	30.980**	32.077***
	(9.233)	(8.559)
Unequal Power Distribution x Psychological Safety		-42.674*
		(17.408)
Constant	41.188	41.075
	(49.959)	(46.247)
Observations	37	37
R-squared	0.325	0.441

Standard errors in parentheses; *** p < 0.001, ** p < 0.01, * p < 0.05, + p < 0.10; psychological safety centered at its mean to show more meaningful coefficients

Manipulation check. We first examined whether the manipulation was successful. Within the unequal power distribution condition, we checked whether the leaders felt more influence over the teams' task than the team members. Team members experienced less influence over the teams' task (Mean = 4.93; SD = 1.01) compared to leaders (Mean = 5.68; SD = 0.90; $t = -2.73$; $p < 0.01$), providing support that our manipulation worked. Table 12 shows that the teams did not have statistically significant differences in their gender composition, mean age, or entrepreneurial experience across conditions.

Escalation of commitment. In line with Hypothesis 2a, we found higher escalation of commitment in the unequal power distribution condition (Mean = 81.63; SD = 25.41) compared

to the equal power distribution condition (Mean = 52.02; SD = 28.03), and the difference was statistically significant (t = -3.37; $p < 0.01$).

Mediating effect of task conflict. Based on 5,000 random samples with replacement from the full sample and our moderator (i.e., psychological safety) as well as control variables as covariates, we derived a bias-corrected confidence interval for the indirect effect of task conflict ($\beta_{a \times b}$ = 8.58, SE = 6.33). As the confidence interval did not include zero (95% CI [0.41 to 27.64]), we concluded that task conflict mediated the relationship between an unequal power distribution and escalation of commitment, supporting Hypothesis 2b.

Moderating effect of psychological safety. To test Hypothesis 2c, we interacted the treatment variable with psychological safety (centered at its mean). As displayed in Table 14, there was a statistically significant interaction between unequal power distribution and psychological safety (β = -42.67, $p < 0.05$), supporting our assumption that the positive effect of unequal power distribution on escalation of commitment is reduced for higher levels of psychological safety in teams. In other words, holding all the other variables constant, a one-unit increase in teams' psychological safety above the overall mean resulted in a decrease in escalation of commitment of around 43% for the teams in the unequal power distribution condition. This finding offers support for Hypothesis 2c.

4.6.5 Robustness check

Our results remained robust for our alternative dependent variable (the binary choice: continue versus terminate), with 89.47% (SD = 31.53%) of the teams in the unequal power distribution condition and 61.11% (SD = 50.16%; t = -2.07, $p < 0.05$) of the teams in the equal power distribution condition indicating that they would continue the project. Testing for moderated mediation, we found evidence that the moderator (psychological safety) affected the a-path in our model (i.e., the relationship between unequal power distribution and task conflict), which

aligns with our general theorizing. In Chapter 8.3.2 in Appendix C, we also report a face-validity check supporting our theoretical premise of increased leader talking time.

4.6.6   Discussion of Study 2

The results of Study 2 provide evidence that uniformity pressures arising from teams' unequal power distribution increase their likelihood of escalating commitment. First, we identified that task conflict was a mediator, suggesting that less powerful team members self-censored and did not voice critical perspectives. Second, we observed that the positive relationship between unequal power distribution and escalation of commitment was moderated by the perceived psychological safety in the teams. This finding supports the notion that uniformity pressures are less severe in a climate wherein team members feel safe to speak up. We now turn to Studies 3 and 4, which replicate the face-to-face experiments with actual entrepreneurs online.

4.7   Study 3—Manipulation of friendship ties (Online experiment)

4.7.1   Participants and design

We recruited participants using the Prolific platform, which is frequently used for behavioral research (Peer et al., 2017; Peer et al., 2022) because it generates high-quality data, and participants can be pre-screened based on characteristics important for the study (specifically, currently active as an entrepreneur) (Engel, Lewis, Cardon, & Hentschel, 2022). In our data collection, we restricted our sample to entrepreneurs in the United Kingdom or the United States whose native language is English.

We collected data from 298 entrepreneurs and randomly assigned them to one of two experimental conditions (*stronger friendship ties* versus *weaker friendship ties*). We excluded participants who did not report any entrepreneurial experience despite declaring "engaged in entrepreneurship" on their Prolific profiles (n = 15). Also, in line with recent publications (e.g., Engel et al., 2022; Kier et al., 2022), we excluded participants who failed attention checks (n = 35), such as not following simple tasks like choosing the middle answer on a Likert scale, incorrectly answering

factual questions about the case in the vignette, or answering in a pattern like choosing "7" for all scale items, as well as those who took a suspiciously short or long time (n = 13), resulting in a final sample of 235 entrepreneurs. All the participants received financial compensation of approximately three pounds for their participation in the experiment. Approximately half of the entrepreneurs were female (51.28 %), they were 43.01 years old on average (SD = 11.95), they had an average of 98.70 months (SD = 149.93) of entrepreneurial experience, 65.96% had a university degree, and they had an average of 7.52 (SD = 49.53) employees in their real-life ventures.

4.7.2   Procedure

After randomly allocating the participants to one of the two conditions, we collected descriptive information. We then presented them with the case vignette of the failing venture. Using case vignettes in an online setting has the substantial advantage of drawing participants' attention to the variable of interest (i.e., teams' structure) and activating associated experiences from their own lives while imagining a realistic entrepreneurial scenario (Aguinis & Bradley, 2014). Specifically, we told the participants to imagine they had founded a venture with a team consisting of three people and then gave them information about their relationship with their co-founders (i.e., "Your two co-founders are close friends of yours" versus "Your two co-founders are colleagues that you met at a start-up competition. You consider your co-founders colleagues, but they are not your friends."). We also presented the venture's situation, which aligned with Studies 1 and 2. In Chapter 8.3.3 in Appendix C, we present the two versions of the vignette in Table C1. Afterward, we asked the participants to take three minutes to imagine a discussion with their co-founders about whether to continue with the venture or instead terminate the venture. We asked the participants to mentally project their arguments, the probable arguments of their co-founders, and the resulting team discussion. We also asked the participants to briefly describe how they would experience the situation in an open text box.

4.7.3   Measures

We used the same measures as in Study 1 and only slightly adapted the instructions (i.e., we told the participants to answer the questions based on their imagined interaction with their co-founders).

Manipulation check. We again followed Huang et al. (2019). We asked the participants to indicate how they would describe their relationships with their co-founders (rated on a seven-point Likert scale ranging from "1 = acquaintance" to "7 = very close friend").

Escalation of commitment. We asked the participants to indicate how likely their respective team would continue the project and escalate commitment (as a percentage ranging from 0 to 100). We again used a binary question (yes = escalate versus no = terminate) as in Study 1 as an alternative dependent variable.

Collective efficacy. We used the same six items measuring collective efficacy as in Study 1 to have the participants indicate the perceived level of their (imagined) teams' competence in performing a variety of business tasks (Zhao et al., 2005) (see Study 1 for all items) ($\alpha = 0.90$).

Control variables. We controlled for the participants' individual risk propensity (see Study 1 for all items) ($\alpha = 0.92$), their age (measured in number of years), gender (female coded as 1 and male coded as 0), and entrepreneurial experience (measured in number of months).

4.7.4   Results

Table 15 reports the means and standard deviations of the variables used in the analysis, separately for both conditions, and provides the results of t-tests for group differences for all the variables. Table 16 reports pairwise correlations for all the variables.

Table 15. T-tests for dependent variable, mediator, manipulation check, and control variables (Study 3)

Variable	Low Level of Friendship Ties			High Level of Friendship Ties				
	Mean1	SD1	N1	Mean2	SD2	N2	t-value	p-value
Escalation of Commitment	56.33	27.11	120	65.53	24.59	115	**-2.72**	**0.01**
Escalation (Yes/No)	0.68	0.47	120	0.82	0.39	115	**-2.39**	**0.02**
Friendship Ties (Check)	3.43	1.56	120	5.35	1.27	115	**-10.33**	**0.00**
Collective Efficacy	5.02	0.97	120	5.44	0.83	115	**-3.56**	**0.00**
Age	43.13	12.61	120	42.88	11.27	115	0.16	0.87
Gender	0.53	0.50	120	0.50	0.50	114	0.38	0.70
Entrepreneurial Exp.	95.96	128.27	120	101.57	170.14	115	-0.29	0.78
Risk Propensity	4.17	1.35	120	4.14	1.25	115	0.13	0.90

Table 16. Pairwise correlations of included variables (Study 3)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Escalation of Commitment	1.000						
(2) Friendship Ties (0/1)	0.176*	1.000					
(3) Collective Efficacy	0.396*	0.227*	1.000				
(4) Age	-0.044	-0.011	0.013	1.000			
(5) Gender	-0.024	-0.025	0.050	-0.080	1.000		
(6) Entrepreneurial Exp.	-0.027	0.019	-0.015	0.263*	0.009	1.000	
(7) Risk Propensity	0.083	-0.009	0.168*	-0.249*	-0.222*	-0.099	1.000

Correlations marked with * are significant at p < .05 or lower

Manipulation check. We found a statistically significant difference between the stronger friendship ties (Mean = 5.35; SD = 1.27) and weaker friendship ties condition (Mean = 3.43; SD = 1.56; t = -10.33; $p < 0.001$), indicating that our manipulation worked. There were also no significant differences in the control variables across conditions.

Escalation of commitment. We found higher escalation of commitment in the stronger friendship ties condition (Mean = 65.53; SD = 24.59) compared to the weaker friendship ties condition (Mean = 56.33; SD = 27.11) and statistical significance for the difference (t = -2.72; $p < 0.01$), thus supporting Hypothesis 1a.

Mediating effect of collective efficacy. To test the mediating effect of collective efficacy, we again employed bootstrap analysis to derive bias-corrected confidence estimates based on 5,000 random samples with replacement from the full sample (Shrout & Bolger, 2002). We included all control variables as covariates. The confidence interval for the indirect effect ($\beta_{a \times b}$ = 4.66; SE 1.63) did not include zero (95% CI [1.85 to 8.23]), thereby supporting Hypothesis 1b.

4.7.5 Robustness check

To check the robustness of our results, we tested whether our results held for the alternative dependent variable (the binary choice: continue versus terminate). Our results remained robust, with 81.74% (SD = 38.80) of the teams in the stronger friendship ties condition and 68.33% (SD 46.71; $t = -2.39$, $p < 0.05$) of the teams in the weaker friendship ties condition indicating that they would continue the project. We report some exploratory tests with an alternative specification of our mediator in Chapter 8.3.3 in Appendix C, which support our general theorizing and findings.

4.7.6 Discussion of Study 3

In Study 3, we replicated all of the results from Study 1 (including the robustness check) with a sample of actual entrepreneurs. It is notable that the effect sizes were substantially larger in the face-to-face experiment, suggesting that groupthink is more likely to emerge in real social interactions than in an imaginary situation. We now turn to the online experiment manipulating the power distribution of the imagined entrepreneurial team.

4.8 Study 4—Manipulation of power distribution (Online experiment)

4.8.1 Participants and design

In Study 4, we employed a one-factor between-subjects design with two experimental conditions (*unequal power distribution* versus *equal power distribution*). When operationalizing the unequal power distribution condition, we chose to place participants in the role of the leader of the new venture (and not in the less powerful role) for three reasons: First, our theoretical argument proposes that a leader's preferences for escalation subsequently lead to uniformity pressures that undermine less powerful team members' contributions of critical thoughts. Therefore, we tested the leader's perspective. Second, as in Study 2, we explained in the vignette that the leader had the final say in the team decision of whether to continue the venture, making the leader's response particularly meaningful. Third, we considered that

entrepreneurs are more likely to actively engage with the role of a powerful team member because they might not answer honestly when taking on a regular team member role due to psychological reactance. We did not test the moderating effect of psychological safety because the construct is not meaningful when assessed by leaders themselves (i.e., leaders typically think of themselves as inclusive).

We again collected data via Prolific following the general procedure outlined in Study 3 with only one additional restriction that participants could not have participated in the previous study (i.e., Study 3). In total, we collected data from 301 entrepreneurs. After excluding participants who did not report any entrepreneurial experience (n = 18), those who failed attention checks (n = 33), and those who took a suspiciously short or long time (n = 13), our sample contained 237 entrepreneurs. All the participants received financial compensation of approximately three pounds for their participation in the experiment. Most of the entrepreneurs were male (53.19 %), they were 41.76 years old on average (SD = 12.83), they had an average of 78.87 months (SD = 135.76) of entrepreneurial experience, 62.87% had a university degree, and they had an average of 5.08 (SD = 33.32) employees in their real-life ventures.

4.8.2 Procedure

We randomly assigned the participants to one of the two conditions (high power or equal power relative to other team members) and started with collecting descriptive information. Before presenting the case vignette, we gave each participant a writing task evoking either a neutral or high sense of power depending on their assigned condition (e.g., Anderson & Galinsky, 2006; Galinsky et al., 2003) that was—like in Study 2—masked as a pre-test for another (unspecified) study. The writing task asked the participants to think of situations in which they had power over another person (see Study 2) or to describe a recent experience of buying groceries in the supermarket (neutral writing task). In the vignette, we told the participants they founded a venture with a team consisting of three people and informed them about the power distribution in the team ("You serve as a regular team member in

the start-up. There is no hierarchy in your team, and you all have the same power" versus "You serve as the leader in the start-up. There is a clear hierarchy in your team, and you have the highest power"; see Table C2 in Chapter 8.3.4 in Appendix C for a full description of each condition). We then asked the participants to take three minutes to imagine a discussion with their co-founders about whether to continue or terminate the venture by mentally projecting their own and the co-founders' arguments and their discussion. The participants briefly described the situation in an open text box.

4.8.3 Measures

We used the same measures as in Study 2 and only slightly adapted the instructions (i.e., we told them to answer the questions based on their imagined interaction with their co-founders).

Manipulation check. To test whether our manipulation worked, we used the same items as in Study 2 asking the participants to indicate the amount of power they felt during the discussion they imagined (see Study 2 for all items) ($\alpha = 0.87$).

Escalation of commitment. We again asked the participants to indicate the likelihood that their teams would continue the project and escalate commitment (as a percentage ranging from 0 to 100) and used a binary yes/no question (as in the previous studies) as an alternative dependent variable.

Task conflict. We asked the participants to indicate the amount of task conflict they imagined in the discussion using the same four items as in Study 2 (see Study 2 for all items) ($\alpha = 0.89$).

Control variables. We controlled for the participants' risk propensity (see Study 1 for all items) ($\alpha = 0.95$), their age (measured in number of years), gender (female coded as 1 and male coded as 0), and entrepreneurial experience (measured in number of months).

4.8.4 Results

Table 17 reports the means and standard deviations of the variables used in the analysis, separately for both conditions, and provides the results of t-tests for group differences for all the variables. Table 18 reports pairwise correlations for all the variables.

Table 17. T-tests for dependent variable, mediator, manipulation check, and control variables (Study 4)

Variable	Equal Power Distribution			Unequal Power Distribution				
	Mean1	SD1	N1	Mean2	SD2	N2	t-value	p-value
Escalation of Commitment	59.45	24.76	115	67.13	26.49	122	-2.30	**0.02**
Escalation (Yes/No)	0.78	0.41	115	0.82	0.39	122	-0.71	0.48
Sense of Power (Check)	4.50	1.24	115	5.52	1.23	122	-6.35	**0.00**
Task Conflict	3.75	1.34	115	3.41	1.29	122	1.96	**0.05**
Age	42.00	13.02	115	41.52	12.71	122	0.28	0.78
Gender	0.48	0.50	115	0.46	0.50	120	0.30	0.76
Entrepreneurial Exp.	87.47	137.03	115	70.77	134.61	122	0.95	0.35
Risk Propensity	4.39	1.36	115	4.29	1.61	122	0.52	0.60

Table 18. Pairwise correlations of included variables (Study 4)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Escalation of Commitment	1.000						
(2) Unequal Power Distribution (0/1)	0.149*	1.000					
(3) Task Conflict	-0.245*	-0.127	1.000				
(4) Age	-0.066	-0.019	-0.136*	1.000			
(5) Gender	0.063	-0.020	-0.088	-0.009	1.000		
(6) Entrepreneurial Exp.	0.099	-0.062	-0.168*	0.180*	-0.015	1.000	
(7) Risk Propensity	0.003	-0.034	0.050	-0.256*	-0.215*	-0.023	1.000

Correlations marked with * are significant at p < .05 or lower

Manipulation check. We checked for differences between the two conditions regarding the participants' experience of power during the discussion they imagined. The participants in the equal power distribution condition experienced less influence over their respective team's task (Mean = 4.50; SD = 1.24) compared to those in the inequality condition (Mean = 5.52; SD = 1.23; t = -6.35; $p < 0.001$), providing support that our manipulation was successful. As shown in Table 17, there were no significant differences in any of the control variables across conditions.

Escalation of commitment. We found higher escalation of commitment in the unequal power distribution condition (Mean = 67.13; SD = 26.49) compared to the equal power

distribution condition (Mean = 59.45; SD = 24.76) and statistical significance in a t-test (t = -2.30; p < 0.05), supporting Hypothesis 2a.

Mediating effect of task conflict. Based on 5,000 random samples with replacement from the full sample and control variables as covariates, we derived a bias-corrected confidence interval for the indirect effect of task conflict ($\beta_{a\,x\,b}$ = 1.63; SE = 0.93). As the confidence interval did not include zero (95% CI [0.28 to 4.02]), we concluded that task conflict mediated the relationship between unequal power distribution and escalation of commitment, thereby supporting Hypothesis 2b.

4.8.5 Robustness check

We again checked whether our results remained robust for our alternative dependent variable (the binary choice: escalate versus terminate) with 81.96% (SD = 38.60%) of the teams in the unequal power distribution condition and 78.26% (SD 41.43%; t = -0.71; p > 0.05) of the teams in the equal power distribution condition indicating that they would continue the project. While these results were descriptively in line with our main effect, we did not find statistical significance. In Chapter 8.3.4 in Appendix C, we report a face-validity check supporting our theoretical premise of increased leader talking time and additional evidence with an alternative specification of our measure for task conflict.

4.8.6 Discussion of Study 4

In Study 4, we replicated the results of Study 2 for the main effect and the mediating effect of task conflict. As expected, we found smaller effect sizes compared to the face-to-face experiment. We did not explicitly test for the moderating effect of psychological safety because our operationalization of the unequal power distribution condition did not allow us to collect meaningful data concerning the level of psychological safety experienced by the participants' imagined teams.

4.9   General discussion

This work aimed to investigate how entrepreneurial teams' structure influences their escalation of commitment to a failing venture. We found support that both friendship ties within the team and an unequal power distribution drive a team's escalation of commitment to a failing venture. Specifically, we found that entrepreneurial teams with friendship ties experience higher levels of collective efficacy, leading to escalation of commitment. Moreover, in teams with an unequal power distribution (usually dominated by a leading co-founder), task conflict is limited, reflecting uniformity pressures driven by dominant leader behavior. We also showed that the positive effect of unequal power distribution on escalation of commitment can be mitigated by teams' psychology safety (Edmondson, 1999), which makes more powerful team members more likely to listen to less powerful team members' concerns (Tost et al., 2012).

4.9.1   Theoretical implications

Our theorizing and findings offer important contributions to the literatures on entrepreneurial team formation, entrepreneurial biases, and group escalation of commitment.

First, we contribute to the literature on entrepreneurial team formation (Francis & Sandberg, 2000; Lazar et al., 2020; Lazar et al., 2022) by providing causal evidence that important features of teams' structure—friendship ties and power distribution—alter team cognition, that is, the way *teams collectively process information* (Dreu et al., 2008). In turn, this effect has implications for teams' strategic decision-making regarding whether to escalate commitment to a failing venture or terminate the venture.

Specifically, previous research has highlighted the benefits associated with strong ties (e.g., friendship and family ties) in entrepreneurial teams, which manifest, for example, in facilitated coordination and trust among co-founders (Francis & Sandberg, 2000; Lazar et al., 2022) as well as in aligned values and visions (Discua Cruz, Howorth, & Hamilton, 2013). Due to these beneficial characteristics, extant research has also noted that in teams sharing friendship

ties, there is lower perceived risk of voicing critical perspectives (e.g., Westphal & Bednar, 2005), which could—contrary to our theorizing—hinder teams' escalation of commitment. However, our findings show that friendship ties also increase teams' collective efficacy, which exacerbates escalation of commitment. Specifically, entrepreneurial teams with friendship ties are likely to collectively ignore risks associated with continuing a failing venture because they firmly believe in their ability to "turn it around". In an exploratory test in Appendix C (Chapter 8.3.1), we show that this "confidence bias" in teams with friendship ties seems to offset their advantage of being able to engage in task conflict openly.

Concerning teams' power structure, the literature has suggested that teams' unequal power distribution can enhance their effectiveness through increased coordination (Halevy et al., 2011; Ronay et al., 2012) or hinder it by imposing communication barriers within teams (Tost et al., 2012, 2013). Previous research in the entrepreneurial context has revealed that unequal power distribution within teams (in terms of hierarchies) can have negative implications for venture performance, especially in teams with a homogeneous functional background and high levels of shared experience (Xie, Feng, & Hu, 2020). This research has also pointed to the importance of matching power positions with those individuals with the highest levels of competence to master the respective tasks (Jung, Vissa, & Pich, 2017). We add to this research that individual team members' potential to escalate commitment needs to be considered when allocating power within teams and could provide additional insights into how task (Jung et al., 2017) and power allocation (Ensley et al., 2000; Xie et al., 2020) affect ventures' performance.

Second, our study contributes to the literature on cognitive biases in entrepreneurship (Åstebro et al., 2007; Busenitz & Barney, 1997; Houghton et al., 2000; Zhang & Cueto, 2017). Previous research has examined cognitive biases chiefly at the individual level (Zhang & Cueto, 2017)—such as the role of overconfidence in entry decisions (Camerer & Lovallo, 1999; Hayward et al., 2006; Simon, Houghton, & Aquino, 2000)—but has rarely focused on the team

level (notable exceptions are Houghton et al., 2000; Huang et al., 2019). This is a significant omission as individual-level biases may or may not operate at the team level (Kerr & Tindale, 2004; Sunstein & Hastie, 2014). The broad implication of our findings is that teams' cognitive biases depend on their structure. We highlight that the debiasing effect of task conflict in a team (cf. Schulz-Hardt et al., 2002) may or may not occur depending on the team's structure. Against this background, teams' structure appears to be an important accelerator or barrier for teams' escalation of commitment and perhaps other biases.

Finally, we contribute to the literature on group escalation of commitment (Bazerman et al., 1984; Thompson et al., 1998; Whyte, 1993) by answering the call to understand how group composition and group processes affect group escalation of commitment (Sleesman et al., 2018). We add to this research by pointing to the interplay between a group's structure and emergent group processes (that enhance or limit critical discourse in the group) as essential drivers of escalation. Our in-depth analysis of the mechanisms driving these results (i.e., collective efficacy, psychological safety, and task conflict) highlights the importance of considering groupthink symptoms when studying group escalation of commitment. We also add to research identifying that an equal distribution of responsibility in a group (e.g., Whyte, 1991) and group members' process accountability (Lerner & Tetlock, 1999; Moser, Wolff, & Soucek, 2020) reduce groups' tendency to escalate. Specifically, we show that within an escalation-enhancing structure (i.e., an unequal power distribution), de-escalation is still possible if powerful team members create a climate of psychological safety, which allows them to leverage each team member's knowledge and unique perspective (Edmondson, 2003).

4.9.2 Practical implications

We also offer valuable practical implications. We note that the decisions of with whom to form an entrepreneurial team and how to distribute the power in a team have a strong and lasting impact on new ventures (Lazar et al., 2020; Lazar et al., 2022). We show that friendship ties

and an unequal power distribution in a team can lead to escalation of commitment to a failing venture. Thus, our results help entrepreneurs carefully consider with whom to form a team from the onset and how to distribute the power within their teams on an ongoing basis (at least for decisions about a failing venture). Furthermore, our findings suggest that entrepreneurial teams with stronger friendship ties may need to consider including non-befriended individuals or establishing an advisory board with external board members to minimize groupthink tendencies when making strategic decisions. We also propose that powerful members of entrepreneurial teams should consider focusing on reducing barriers for team members to contribute—that is, creating an atmosphere in which people feel safe speaking up (Edmondson, 1999).

4.9.3 Limitations and avenues for future research

Our research has certain limitations that offer avenues for future research. First, our results are based on laboratory and online experiments, not real ventures. The laboratory setting (classroom) was preferred over a field setting because it is impossible to manipulate the structure of an entrepreneurial team in a real new venture. Also, the relationships studied are grounded in groupthink—a broad and universal theory—making a student sample appropriate since students' group processes are unlikely to be different from those of real entrepreneurs (cf. Hsu et al., 2017). Still, researchers may attempt to manipulate the structure of nascent entrepreneurial teams emerging in start-up competitions or accelerator programs and observe their trajectories over an extended period (see for instance Lazar et al., 2022).

Second, we relied on individuals' self-reports for specific variables of interest (e.g., task conflict and psychological safety). Although there are high correlations between self-reports and objective ratings by independent observers (e.g., self-reported and recorded talking time in study of Tost et al., 2013), future research could benefit from video recordings and objective ratings of focal constructs, such as psychological safety, from trained coders in face-to-face experiments.

Finally, in all our experiments, we decided to create teams of three since this is the typical size of a founding team (Ruef, 2010). We acknowledge that our manipulations could have different effects for different team sizes, again offering fruitful avenues for future research.

4.10 Reflection on Chapter 4

In Chapter 4, I turned my attention to groupthink, an important group dynamic that influences how groups form their collective cognition. By relying on an experimental design (as opposed to relying on archival data as in Chapters 2 and 3), I was able to explicitly measure the group processes referred to in hypothesizing the theoretical relationship between structural features (friendship ties and power structure) of the group and escalation of commitment (i.e., an important entrepreneurial outcome). As such, the research underlying this chapter is an important complement to the other two chapters, and together they provide intriguing and rich insights into the overarching research objective of the dissertation. While in Chapter 3, I discussed growth and survival in an interdependent and thus more differentiated way, in Chapter 4, I focused exclusively on the dark side of firm survival caused by structure-induced group dynamics that lead to "distorted" collective cognition of the entrepreneurial group.

5 General discussion

With my dissertation, I aspired to contribute to a better understanding of how the interplay between individuals' cognitions and emergent group processes in entrepreneurial groups shapes private firms' growth and survival. I approached this overarching question from different angles, resulting in contributions to multiple research streams. In the following, I present a short summary of all findings, before I turn to elaborating on the main scholarly and practical implications of my dissertation's findings.

5.1 Summary of findings

In Chapter 2, I investigated how owners' judgment can be enabled or constrained contingent on the organizational context, such as contingent on the family embeddedness of the entrepreneurial group. In particular, I demonstrated that both owners' matching and governance competences are positively related to firm growth. However, when the entrepreneurial group consists of family ties, (only) the effect of governance competence is constrained, while the presence of family ties does not constrain or strengthen the effect of matching competence on firm growth. Moreover, I found that these effects only hold for younger firms, supporting the notion that the relevance of owners' judgment declines with increasing professionalization of the organizational structure.

In Chapter 3, I shifted the focus to examining how differences in owners' cognitions *within* an entrepreneurial group converge to affect firm-level outcomes. In particular, I examined how the empowerment of role-congruent preferences among owners in the entrepreneurial group leads to divergent effects on firm growth and survival. The results are consistent with my theorizing of an interplay between group members' preferences for growth and risk and these two examined outcomes (i.e., women seem to place more emphasis on survival than men, resulting in a survival advantage and a growth disadvantage for firms with more ownership shares held by women). I also established that in larger groups, this growth

disadvantage is reduced while the survival advantage remains. The identification of group size as a boundary condition of these findings suggests that group composition determines whether and how role-congruent preferences "play out" in group interactions.

In Chapter 4, I focused on better understanding the unique group processes that explain why differences in entrepreneurial groups' structure have measurable consequences at the firm level. In particular, I established that friendship ties and an unequal power structure lead entrepreneurial groups to escalate their commitment. The mechanisms identified for both theoretical relationships are consistent with predictions made by groupthink theory in that for groups of friends, higher levels of collective efficacy explain the outcome (i.e., friends overestimate their agency in "turning things around"), and for groups with an unequal power structure, limited task conflict serves as the primary mechanism (group members with less power are inhibited from speaking up). Psychological safety mitigates the positive relationship between entrepreneurial groups' unequal power structure and escalation, supporting the idea that if groups can create an atmosphere where people feel safe to speak up, groupthink can be circumvented.

5.2 Broader scholarly implications

The theorizing and empirical insights generated in my dissertation offer a broad set of scholarly implications. I elaborate on the contributions to four literature streams below—the literature on strategic ownership, entrepreneurial biases, entrepreneurial team formation and power in organizations—to conclude the dissertation with a final assessment of the most important implications generated *across the three previous chapters.* As such, I do not repeat the tailored contributions to additional literature streams that only apply to one of the chapters (e.g., the contributions to Penrosean growth theory discussed in Chapter 2.6.1). In the following, I use the terms "group" and "team" interchangeably to reflect the connotation in the respective literature streams.

5.2.1 Implications for literature on strategic ownership

Burgeoning literature on the strategic role of ownership in firms' value creation to date has mostly been conceptual and has predominantly been situated at the individual level of analysis, for example in focusing on owners' competence and cognitive processes of building and testing theories (e.g., Foss et al., 2021; Schulze & Zellweger, 2021; Zellweger & Zenger, 2023). My dissertation's theorizing and findings contribute to this emerging area of research in situating owners' judgment and theories of value in the organizational context of an entrepreneurial group (Foss et al., 2019).

First, I shed light on the contextualized relationship between owners' judgment (i.e., competence and preferences) and firms' value creation (Foss et al., 2021; Foss et al., 2023; Schulze & Zellweger, 2021) by exploring the role of family embeddedness (Chapter 2) and the size of the owner team (Chapter 3) as boundary conditions of these baseline relationships. As such, my dissertation's findings contribute to a more complete understanding of how the organizational context constrains or enables the influence of owners' cognitions on firms' value creation (Boudreaux et al., 2019; Foss et al., 2019; Foss et al., 2021; Foss & Klein, 2012).

Second, the focus on owner teams (and on the distribution of ownership shares among owners), illuminates our understanding of how individual owners' cognitive processes are intertwined with such of other actors within the firm in shaping firms' development and value creation. The establishment of the size of a group as a boundary conditions of the theoretical relationships between the shares held by women owners and firm growth as well as firm survival suggests that individual owner preferences are more or less likely to affect firm level outcomes dependent on the group context and interactions with other owners of the firm (cf. Bird & Zellweger, 2018; Foss et al., 2021).

Third, the operationalization and measurement of ownership competence via LinkedIn data in Chapter 2 has no precedent and thus may lay the groundwork for empirically measuring ownership competence and related, unobservable owner characteristics in the future. This

empirical contribution is an important advancement of the current literature because for private firms data is generally scarce, and "empirical blueprints" are warranted to generate knowledge on this predominant but yet underresearched organizational form (Fitza & Tihanyi, 2017).

5.2.2 Implications for literature on entrepreneurial biases

Throughout the dissertation, also the "distortion" of judgment (e.g.., in terms of cognitive biases) constituted a recurring element. Cognitive biases are generally well-studied in the field of entrepreneurship (Åstebro et al., 2007; Busenitz & Barney, 1997; Houghton et al., 2000; Zhang & Cueto, 2017). However, previous research has mostly focused at the individual rather than the group level (Zhang & Cueto, 2017) and has chiefly discussed implications of the overconfidence-bias (Camerer & Lovallo, 1999; Hayward et al., 2006; Simon et al., 2000). I add to this literature stream by scrutinizing how cognitive biases operate at the team level (in line with Houghton et al., 2000; Huang et al., 2019) and by focusing on escalation of commitment, an important but less considered bias by entrepreneurship scholars (cf. Zhang & Cueto, 2017).

First, in Chapter 4, I focused on an underresearched team level cognitive bias—escalation of commitment—where there is only limited research on its antecedents (Huang et al., 2019; Kier et al., 2022). The four experiments in Chapter 4 revealed a causal effect of the *team design* on entrepreneurial teams' escalation of commitment, implying that certain team structures (here: unequal power structure and friendship ties) can represent facilitators (or barriers) to entrepreneurial teams' escalation of commitment and perhaps other biases. By shedding light on how groupthink symptoms explain these results, I also highlight additional (more proximal) antecedents of entrepreneurial teams' escalation of commitment, being collective efficacy and task conflict. The identification of psychological safety as a moderator in the relationship between an unequal power structure and teams' escalation of commitment in Chapter 4 may also provide starting points for yet limited research on de-escalation (e.g.,

Moser et al., 2020) and more broadly debiasing (Larrick, 2004; Milkman, Chugh, & Bazerman, 2009; Soll, Milkman, & Payne, 2015; Sunstein & Hastie, 2014), an area that yet has to be developed within the entrepreneurship literature (Zhang & Cueto, 2017).

Second, in Chapter 3, I also elaborated on how firms may be more or less inclined to polarize toward risk-taking dependent on the gender composition of the owner team. I hereby built on well-established findings of men's overconfidence that elevates their risk preference (Chen et al., 2019; Huang & Kisgen, 2013), and on findings of how women's social proclivities foster critical deliberation within teams (e.g., Farh et al., 2020). Against this background, the findings of Chapter 3 contribute to limited research discussing the team-level implications and the within-team boundary conditions of an individual's overconfidence (Chen et al., 2019; Chen et al., 2022; Houghton et al., 2000).

5.2.3 Implications for literature on entrepreneurial team formation

The findings from the different chapters of my dissertation also contribute to the literature on entrepreneurial team formation that has extensively discussed performance implications of different formation strategies (Discua Cruz et al., 2013; Francis & Sandberg, 2000; Lazar et al., 2020; Lazar et al., 2022). I add to this literature by discussing how the team structure (i.e., the results of certain formation strategies) alters entrepreneurial teams' collective cognition and thus influences important strategic decisions.

First, extant research has described how entrepreneurial teams composed of strong ties (e.g., friendship and family ties) benefit from facilitated coordination and better alignment of visions (Discua Cruz et al., 2013; Francis & Sandberg, 2000; Lazar et al., 2022). In my dissertation, I focused primarily on the negative consequences arising from strong ties within an entrepreneurial team: Specifically, the findings in Chapter 2 suggest that due to strong ties among members of the entrepreneurial team (here: family ties), the governance competence of the key decision-maker within the team (i.e., the owner-manager) is constrained and

consequently less likely to positively influence firm growth. Similarly, in Chapter 4, I illustrated how teams consisting of strong (friendship) ties are more likely to develop a sense of collective efficacy, an emergent state that increases the likelihood of escalation of commitment (Whyte, 1998). It follows that the imprinting of private roles (such as family and friendship roles) on business activities (Francis & Sandberg, 2000; Tagiuri & Davis, 1996; Yang & Aldrich, 2014) has implications for a variety of decision-making processes that may ultimately lead to suboptimal outcomes, such as escalation of commitment or the constraint of certain team members' competences.

Second, previous literature has suggested that structural power inequality within entrepreneurial teams can have negative implications for firm performance, especially in teams with homogeneous functional backgrounds and high levels of shared experience (Xie et al., 2020), and when power positions are not held by those members with the highest levels of competence to perform the respective tasks (Jung et al., 2017). In Chapter 4, I found that an unequal power structure can facilitate the emergence of team-level biases such as escalation of commitment, and argued that this is the consequence of an exacerbation of the most powerful team member's individual bias. This finding underscores the importance of allocating power to the most competent and "least biased" entrepreneurial team member.

Third, while meta-analyses have pointed to a positive effect of team size on private firms' performance (Hmieleski & Ensley, 2007; Jin et al., 2017), there are also arguments why higher levels of behavioral integration (and coordination) in smaller teams might lead to superior performance (Simsek, Veiga, Lubatkin, & Dino, 2005). In Chapter 3, I pointed to an interesting interplay between the size of an owner team and its gender composition: The findings suggest that larger teams—with more ownership shares held by women—consistently outperform other teams (at least in terms of growth and survival), which could be a consequence of women's social proclivities that help to reap the benefits of larger teams' resources. My

dissertation's findings thus add another contingency factor (equity held by women) to the relationship between team size and performance.

5.2.4 Implications for literature on power in organizations

My dissertation also provides new insights into the literature on power in young organizations (Bennedsen & Wolfenzon, 2000; Breugst, Patzelt, & Rathgeber, 2015; Jung et al., 2017; Xie et al., 2020) that, for example, has discussed the implications of power inequality on team interactions and performance. I add to this literature by highlighting the key role of ownership power (Finkelstein, 1992; French, Raven, & Cartwright, 1959) as the "empowerment" of certain cognitions (such as preferences and competences), and by scrutinizing boundary conditions of the theoretical relationship between unequal power distribution in private firms and firms' value creation.

First, I discussed how firm ownership leads to an empowerment of the cognitions of certain group members (i.e., those that hold more ownership shares) of an entrepreneurial group. In Chapter 3, I established that the amount of shares held by women is positively [negatively] related to firm survival [growth], which aligns with the assumption that owners' (role-congruent) preferences are empowered *proportionally* to their decision-making authority that accompanies their ownership rights. Similarly, I discussed in Chapter 2 how ownership (here: being the majority shareholder) empowers owner-managers' different competences. These findings reinforce the importance of considering ownership (vis-à-vis structural or other forms of power) as a primary source of power in private firms and highlights the key role of cognitions in explaining why the allocation of ownership to certain individuals is beneficial or detrimental to (different forms of) firms' value creation (cf. Jung et al., 2017).

Second, my dissertation contributes to the ongoing debate about whether power inequality in organizations facilitates or constrains firm performance (Greer, Jong, Schouten, & Dannals, 2018; Xie et al., 2020). My findings suggest that the relationship between unequal power structures and firm-level outcomes depends on the group size and on certain group

interactions, such as psychological safety. For example, in Chapter 3, I demonstrated that firms face a growth disadvantage when more ownership is allocated to women, but only in the context of a group with few members.

5.3   Practical implications

The findings of my dissertation also offer valuable practical implications for entrepreneurial groups and, by extension, for stakeholders who *evaluate* entrepreneurial groups based on observable characteristics. In particular, I discussed how the group design can facilitate the emergence of certain dysfunctional group processes with implications for a firm's strategic direction. The results of my dissertation imply that early "group design" decisions, such as with whom to form a group or how to allocate ownership and power within the group, have long-lasting effects on the collective cognition of the entrepreneurial group and thus on strategic decision-making. In particular, forming an entrepreneurial group with friends or family members may complicate the establishment of effective governance structures and may foster the escalation of commitment to a failing venture. Thus, entrepreneurial groups consisting of friendship or family ties may benefit from including external board members in strategic decisions, a measure that investors might also proactively demand when investing in groups characterized by such strong relational ties.

The distribution of power and ownership also appears to have important implications for decision quality. For example, I discussed how more powerful group members' subjective perceptions of power induce patterns of verbal dominance that disproportionately emphasize their perspectives in strategic decision-making. While there are advantages to unequal power distributions, such as better coordination of tasks within the group, groups with an unequal power distribution need to proactively mitigate the occurrence of such *dysfunctional group dynamics* (e.g., by fostering an atmosphere of psychological safety). In addition, I provided evidence that group members' biological sex—and associated role-congruent preferences of

group members—affect important strategic decisions, while groups entailing both men and women seem to strike a balance between the pursuit of growth and survival that may be attractive to investors. The findings of Chapter 3 also suggest the superiority of large entrepreneurial groups where more ownership is held by women, which is again a group composition that investors may want to actively seek out.

5.4   Avenues for future research

While a substantial body of research discusses the role of entrepreneurs' individual cognitions in explaining how firms' evolve and develop over time (Baron, 1998, 2004; Grégoire et al., 2011), less research discusses the role of entrepreneurial groups' collective cognition, despite the prevalence of groups making decisions in the firm context (Patzelt et al., 2021; Shepherd et al., 2019; West III, 2007). As West III (2007: 78) noted: "While the founders and each top manager will have individual perspectives and cognitions about their new venture, it is a collective perspective or a collective knowledge structure at the team level that guides the direction of the venture". Thus, better understanding how entrepreneurial groups integrate individual group members' judgment to form a collective perspective that guides the direction of a firm is critical. In my dissertation, I generated new insights into how individuals' cognitions enfolds differently dependent on the group structure (as an antecedent of certain group processes), illuminating the complexity of how collective cognition emerges. Still, more research is needed to better understand how groups form shared mental models, or how they integrate their divergent perspectives, and to explore both within-group and external boundary conditions to these relationships (see for example Breugst et al., 2018).

Throughout the dissertation, I built on well-established findings of how certain group structures cause distinct group processes, and empirically measured proxies for groupthink symptoms in Chapter 4. However, future research could undertake additional efforts in measuring these group processes (such as group polarization in the context of Chapter 3) to

arrive at a more nuanced and granular understanding of when and how group processes influence the aggregation of individual cognitions into groups' collective cognition. For instance, researchers could rely on recorded videos of venture pitches, similar to Liao et al. (2023), and scrutinize entrepreneurial group members' interactions contingent on the group composition and individual cognitions.

In addition, the experimental design employed in Chapter 4 could be extended by simultaneously capturing each group member's individual mental model of a situation and the group's evolving shared mental model. This approach would make it possible to better understand whose perspectives carry the most weight in the groups' shared mental model, and to identify dysfunctional group processes that explain why some information and perspectives are not considered in the groups' shared mental model. Such a process-based investigation would also allow to examine the process of how the different competences of individual group members are aggregated into groups' collective cognition, which may be a valuable extension for the research method in Chapter 2.

Finally, while not all research questions were suitable for complementary experimental studies, qualitative insights may help to gain additional insights into the underlying process at play (Wellman, Tröster, Grimes, Roberson, Rink, & Gruber, 2023), again representing an interesting avenue for future research.

6 Conclusion

In my dissertation, I shed light on how entrepreneurial group members' individual cognitions feed into the collective cognition of the group, focusing especially on the interplay with group processes. I mostly focused on firm owners of private firms, which provided me with the ideal setting for my research objective because they are the ultimate decision-makers within an entrepreneurial group. I found that owners' judgment and preferences, shaped by structure-induced group dynamics, have a strong, but context-dependent, impact on key entrepreneurial outcomes. I hope that my dissertation inspires scholars to further take efforts to investigate the antecedents and consequences of entrepreneurial groups' collective cognition.

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8 Appendix

8.1 Appendix A (Chapter 2)

8.1.1 Data quality verification

Orbis database obtains its data from various sources including regulatory filings and own proprietary sources. While the data is very rich, there are some data quality issues like missing values that needed to be addressed. Adhering to stringent requirements and following prior studies utilizing BvD data (Faccio et al., 2011), we replaced missing values in total assets with the sum of fixed (=intangible + tangible + other assets) and current assets. We further winsorized all balance sheet items on a 0.5% level and deleted the top and bottom 0.1% values in employees, sales, total assets, and sales growth, as analyses revealed some faulty data entries beyond these bounds. To ensure a strong interconnection between the owner(s) and the firm, we further restricted our sample to firms that had fewer than 11 different owners in every year. We excluded specific industries such as public and service sectors, so as not to confound our findings given these sectors' unique characteristics (Querbach, Bird, Kraft, & Kammerlander, 2020).[27] Finally, we compared firm size and financial variables with other articles using BvD data (e.g., Belenzon et al., 2016; Kulchina, 2016) and did not find evidence of a skewed distribution of firms along measures of firm size or financials. Table A1 summarizes the key descriptive variables of the sample.

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[27] In particular: agriculture, forestry and fishing; mining and quarrying; electricity and gas; water supply; sewerage and waste; human health and social work; and education, as well as financial services and insurance activities.

Table A1. Means, medians, standard deviations, and quartiles for the key descriptive variables

Variable	Obsv.	Mean	Median	SD	Min	p10	p90	Max
Industry-Adjusted Sales Growth	9,257	0.011	-0.016	0.213	-0.997	-0.155	0.210	1.256
Employees (Log)	9,257	2.820	2.773	1.061	0.000	1.609	4.007	8.273
Leverage	9,257	0.643	0.646	0.315	0.049	0.251	0.969	2.450
No Higher Education	9,257	0.415	0.000	0.493	0.000	0.000	1.000	1.000
Bachelor's Degree	9,257	0.038	0.000	0.192	0.000	0.000	0.000	1.000
Postgraduate Degree	9,257	0.547	1.000	0.498	0.000	0.000	1.000	1.000
Total Work Experience (Log)	9,257	5.370	5.485	0.757	0.693	4.454	6.144	7.357
Network Ties (Log)	9,257	4.789	5.112	1.423	0.000	2.890	6.217	6.217
Ownership Concentration	9,257	0.750	0.870	0.265	0.100	0.380	1.000	1.000
Eponymy (0/1)	9,257	0.475	0.000	0.499	0.000	0.000	1.000	1.000
Institutional Shareholder (0/1)	9,257	0.051	0.000	0.221	0.000	0.000	0.000	1.000
Lambda	9,257	0.937	0.883	0.620	0.001	0.177	1.791	3.768
Inverse Mills Ratio	9,257	1.533	1.541	0.219	0.753	1.214	1.795	2.399
Family Firm (0/1)	9,257	0.372	0.000	0.483	0.000	0.000	1.000	1.000
Firm Age (log)	9,257	2.922	2.944	0.773	0.693	1.946	3.892	6.091
Exp.-Based Matching Comp.	9,257	0.370	0.410	0.270	0.000	0.000	0.697	1.000
Exp.-Based Governance Comp.	9,257	0.464	0.500	0.278	0.000	0.000	0.937	1.000

Table A2. First-stage model of Heckman selection model—Factors predicting the likelihood of survival

Variables	Coefficients (Robust Errors)
Firm Size (t-1)	-0.169***
	(0.006)
Leverage (t-1)	1.499***
	(0.060)
Leverage^2 (t-1)	-0.330***
	(0.023)
Ownership Concentration	0.321***
	(0.033)
Eponymy (0/1)	-0.173***
	(0.017)
Institutional Shareholder (0/1)	-0.032
	(0.043)
Family Firm (0/1)	-0.139***
	(0.018)
Firm Age	-0.217***
	(0.010)
Industry Dummies	YES
Observations	404,149
Number of Firms	155,710
Number of Failures	13,343
Wald Chi Squared	5,684.98***

Note: Robust standard errors in parentheses. + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A3. First-stage model of Heckman selection model—Factors predicting the existence of owners' LinkedIn profile

Variables	Coefficients (Robust Errors)
Firm Size (t-1)	-0.005+
	(0.003)
Leverage (t-1)	0.165***
	(0.027)
Leverage^2 (t-1)	-0.115***
	(0.015)
Ownership Concentration	0.046**
	(0.014)
Eponymy (0/1)	0.341***
	(0.007)
Institutional Shareholder (0/1)	-0.068***
	(0.018)
Family Firm (0/1)	-0.111***
	(0.008)
Firm Age	-0.120***
	(0.005)
Industry Dummies	YES
Year Dummies	YES
Constant	-1.350***
	(0.038)
Observations	225,607
Number of Firms	57,925
Wald Chi Squared	1,661.53***

Note: Robust standard errors in parentheses. + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table A4. Development of items for exploratory factor analysis

#	Bag of words	Rationale for Inclusion	Final Item
M	research_, enginee_	Experience in research and engineering contribute to a detailed *understanding of resources attributes* and potential value, which is central to matching competence.	I am experienced in searching for alternative uses for the firm's resources.
M	implement_	Experience with the implementation and realization of novel structures and "ways of doing things", as well as the generation of new ideas, contributes to *better judgment for future matching activities*.	I am experienced in implementing new solutions to increase the firm's efficiency.
M	innovation, patent		I am experienced in assembling the firm's resources to pursue innovative ideas.
M	found_, freelance, startup, owner	Experience with founding contributes to owner's skill to experiment and re-iterate business ideas until an optimal resource allocation is found. This broadens the sphere for the *consideration of alternative resource configurations* which is central to matching competence.	I am experienced in founding new ventures.
M	launch		I am experienced in launching new products or services.
M	testing	Experience with experimentation and the actual *use* of resources allows *exploring their attributes* in terms of different functions, and complementarities with other resources. This enables assessing their value and therefore increases matching competence.	I am experienced in conducting thought experiments and testing alternative resource configurations to determine their potential value.
M	develop_, build_, established		I am experienced in developing new products or services out of the firm's existing resource base.
M	integrat_, acquisition, expansion	Experience with acquiring and integrating elements to a given structures (e.g., the current resource base), helps owners to better *assemble capabilities* required to pursue novel resource combinations in the future, which constitutes matching competence.	I am experienced in integrating new resources into the firm's existing resource base.
M	optimi_, automation	Experience with optimization goes along with the *transfer of resources from lower to higher valued uses*, which resembles matching competence.	I am experienced in optimizing the firm's efficiency and effectiveness by configuring resources in a novel way.

Table A4. Development of items for exploratory factor analysis (continued)

#	Bag of words	Rationale for Inclusion	Final Item
M	creat_, marketing, sell, design_	Experience in creative capacities (like design or marketing) contributes to owner's out-of-the-box creative thinking. This is a predisposition to *overcome functional fixedness* (which stands diametrically opposed to matching competence).	I am experienced in finding creative solutions to address the firm's challenges.
M	conception		I am experienced in conceptualizing new opportunities for value creation.
M	transfor-mation	Experience related to transformation processes allow the owner to better identify *productive rearrangements of the existing resource base* of the firm.	I am experienced in transforming existing resource bundles to a new use to create value for the firm.
M	strateg_, consult_	Experience in strategizing and consulting sharpen the *owner's foresight* about the value created by different future, yet unknown, resource configurations, which is central to matching competence.	I am experienced in developing strategies to strengthen the firms' future value creation.
M	collaboration	Experience in collaborating with other stakeholders usually goes along with *learning about and integrating different peoples' judgment*, which should be beneficial for owners' matching competence as it helps to generate novel ideas regarding resource allocations.	I am experienced in collaborating with stakeholders to create new opportunities for the firm.
M	recruiting	Experience in recruiting relates to the process of *matching individuals with tasks*, which should help owners to better understand employees' (i.e., managers') productive abilities that constitute crucial firm resources.	I am experienced in recruiting managers that complement the firm's resource base well (e.g., in terms of knowledge or other capabilities).
M + G	coordinat_, co-found_	Experience in coordinating tasks and other people, allows owners to develop skills in *structuring organizations* in a way that allows them to reach their goals, i.e., their vision.	I am experienced in coordinating activities (e.g., decomposing tasks into subtasks or budgeting) within the firm that contribute to achieve the firm's overarching goal.

Table A4. Development of items for exploratory factor analysis (continued)

#	Bag of words	Rationale for Inclusion	Final Item
G	head, director, lead, manag_	Experience in leading/managing employees contributes to owner's knowledge on how to structure the organization and internal policies, in order to enable an *alignment of incentives* of the employees to their own, which is crucial for governance competence.	I am experienced in managing other people (e.g., employees).
G	chief, executive, officer, owner, vice		I am experienced in crafting incentives for the firm's employees that help to align their interests with those of the firm.
G	supervisor	Experience with supervising employees (e.g., in terms of monitoring their actions) as well as controlling KPIs contributes to the owner's knowledge in how to set up *budget and reporting regimes* that contribute to the pursuance of their envisioned idea of value creation. This is a central idea of governance competence.	I am experienced in supervising employees to increase the firm's efficiency (e.g., when delegating key tasks).
G	control_		I am experienced in introducing control-mechanisms to ensure that the firm's goals are fulfilled.
G	monitor_, board,		I am experienced in monitoring employees (e.g., using budgeting and reporting systems) to increase the efficiency of the firm.
G	coaching	Experience in coaching and advising employees should contribute to owner's governance competence, as it strengthens their judgment *how and when to appoint and support employees*, in order to ensure that they follow the owner's envisioned strategy.	I am experienced in coaching employees on how to employ their talents to contribute to the envisioned organizational strategy.
G	advisor		I am experienced in advising employees on how to contribute to the firm's overarching goals.
G	operations	Experience with managing the firm's operations, gives the owner an *understanding of organizational complexities*, which helps to compose an organizational design (e.g., in terms of delegation of authority to managers in combination with reporting policies), that contributes to their envisioned idea of value creation.	I am experienced in delegating day-to-day decisions to employees.

Table A5. Random-effects panel regressions for industry-adjusted sales growth including timing competence

DV: Industry-Adjusted Sales Growth	Coefficients
Firm Size (t - 1)	0.002
	(0.007)
Leverage (t - 1)	0.083+
	(0.046)
Leverage^2 (t - 1)	-0.045
	(0.031)
Bachelor's Degree	0.003
	(0.012)
Postgraduate Degree	0.001
	(0.005)
Total Work Experience	-0.010**
	(0.003)
Network Ties	0.004*
	(0.002)
Ownership Concentration	0.012
	(0.011)
Eponymy (0/1)	0.123
	(0.102)
Institutional Shareholder (0/1)	0.103
	(0.072)
Lambda	-0.004
	(0.028)
Inverse Mills Ratio	0.451
	(0.335)
Family Firm (0/1)	-0.037
	(0.035)
Firm Age	-0.077*
	(0.033)
Industry Dummies	YES
Year Dummies	YES
Key Independent Variables	
H1a: Exp.-Based Matching Competence	0.034***
	(0.010)
H1b: Exp.-Based Governance Competence	0.021*
	(0.010)
Exp.-Based Timing Competence	0.002
	(0.026)
Constant	-0.678
	(0.581)
Observations	9,257
Number of Firms	2,509
R-Squared Overall	0.024
R-Squared Between	0.062
R-Squared Within	0.020

Note: The coefficients for the industry and year dummies included in all regressions are not reported. Standard errors are in parentheses (clustered at the firm level). Analyses with the logarithm of total assets as an alternative measure of firm size yield identical results.
+ p < .10, * p < .05, ** p < .01, *** p <.001.

Table A6. Random-effects panel regressions for industry-adjusted sales over employees ratio

DV: Industry-Adjusted Sales over Employees Ratio	Coefficients
Firm Size (t-1)	0.599+
	(0.309)
Leverage (t-1)	-4.834
	(5.568)
Leverage^2 (t-1)	3.370
	(4.050)
Bachelor's Degree	-0.367
	(0.713)
Postgraduate Degree	-0.048
	(0.375)
Total Work Experience	-0.132
	(0.234)
Network Ties	-0.356*
	(0.157)
Ownership Concentration	0.230
	(1.347)
Eponymy (0/1)	-11.486
	(12.310)
Institutional Shareholder (0/1)	4.600
	(2.906)
Lambda	2.243+
	(1.296)
Inverse Mills Ratio	-40.627
	(43.934)
Family Firm (0/1)	5.184
	(4.076)
Firm Age	4.132
	(4.220)
Industry Dummies	YES
Year Dummies	YES
Key Independent Variables	
H1a: Exp.-based Matching Competence	1.464+
	(0.809)
H1b: Exp.-based Governance Competence	2.508+
	(1.315)
Constant	75.914
	(79.201)
Observations	9,256
Number of Firms	2,509
R-Squared Overall	0.008
R-Squared Between	0.018
R-Squared Within	0.003

Note: The coefficients for the industry and year dummies included in all regressions are not reported. Standard errors are in parentheses (clustered at the firm level). Analyses with the logarithm of total assets as an alternative measure of firm size yield identical results.
+ p < .10, * p < .05, ** p < .01, *** p < .001.

Table A7. Random-effects panel regressions for industry-adjusted sales growth [Excl. observations with indefinite largest shareholder]

DV: Industry-Adjusted Sales Growth	(1)	(2)	(3)	(4)
Firm Size (t-1)	-0.007	-0.007	-0.007	-0.007
	(0.004)	(0.004)	(0.004)	(0.004)
Leverage (t-1)	0.050	0.052	0.050	0.050
	(0.070)	(0.070)	(0.070)	(0.070)
Leverage^2 (t-1)	-0.022	-0.024	-0.023	-0.024
	(0.046)	(0.046)	(0.046)	(0.046)
Bachelor's Degree	-0.001	-0.000	-0.002	-0.002
	(0.014)	(0.014)	(0.014)	(0.014)
Postgraduate Degree	0.002	0.003	0.002	0.002
	(0.005)	(0.005)	(0.005)	(0.005)
Total Work Experience	-0.010*	-0.010*	-0.009*	-0.009*
	(0.004)	(0.004)	(0.004)	(0.004)
Network Ties	0.004+	0.004+	0.004+	0.004+
	(0.002)	(0.002)	(0.002)	(0.002)
Ownership Concentration	0.005	0.006	0.005	0.006
	(0.025)	(0.025)	(0.025)	(0.025)
Eponymy (0/1)	0.018	0.027	0.020	0.024
	(0.126)	(0.126)	(0.127)	(0.127)
Institutional Shareholder (0/1)	-0.014	-0.015	-0.015	-0.015
	(0.027)	(0.028)	(0.028)	(0.028)
Lambda	-0.011	-0.011	-0.009	-0.008
	(0.032)	(0.032)	(0.032)	(0.032)
Inverse Mills Ratio	0.126	0.158	0.134	0.148
	(0.459)	(0.460)	(0.461)	(0.462)
Family Firm (0/1)	-0.000	0.028	-0.000	0.014
	(0.042)	(0.044)	(0.042)	(0.044)
Firm Age	-0.050	-0.053	-0.014	-0.018
	(0.045)	(0.045)	(0.046)	(0.046)
Industry Dummies	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES
Key Independent Variables				
H1a: Exp.-based Matching Competence	0.041***	0.051**	0.162**	0.162**
	(0.012)	(0.017)	(0.059)	(0.059)
H1b: Exp.-based Governance Competence	0.031**	0.053***	0.184***	0.180***
	(0.011)	(0.016)	(0.052)	(0.052)
Moderating Effects				
H2a: Exp.-Based Matching Competence x Family Firm		-0.020		-0.004
		(0.024)		(0.025)
H2b: Exp.-Based Governance Competence x Family Firm		-0.052*		-0.031
		(0.022)		(0.023)
H3a: Exp.-Based Matching Competence x Firm Age			-0.039*	-0.039*
			(0.018)	(0.019)
H3b: Exp.-Based Governance Competence x Firm Age			-0.050**	-0.045**
			(0.016)	(0.017)
Constant	-0.098	-0.172	-0.230	-0.254
	(0.836)	(0.838)	(0.843)	(0.843)
Observations	6,613	6,613	6,613	6,613
Number of Firms	1,820	1,820	1,820	1,820
R-Squared Overall	0.027	0.028	0.029	0.030
R-Squared Between	0.068	0.071	0.074	0.075
R-Squared Within	0.022	0.022	0.023	0.023

Note: The coefficients for the industry and year dummies included in all regressions are not reported. Standard errors are in parentheses (clustered at the firm level). Analyses with the logarithm of total assets as an alternative measure of firm size yield identical results.
+ p < .10, * p < .05, ** p < .01, *** p < .001.

Table A8. Random-effects panel regressions for industry-adjusted sales growth [Excl. observations with largest shareholder holding less than 25% equity]

DV: Industry-Adjusted Sales Growth	(1)	(2)	(3)	(4)
Firm Size (t-1)	-0.008*	-0.008*	-0.008*	-0.008*
	(0.004)	(0.004)	(0.004)	(0.004)
Leverage (t-1)	0.052	0.053	0.050	0.050
	(0.062)	(0.062)	(0.062)	(0.062)
Leverage^2 (t-1)	-0.023	-0.024	-0.023	-0.023
	(0.041)	(0.041)	(0.041)	(0.041)
Bachelor's Degree	0.003	0.003	0.003	0.002
	(0.012)	(0.012)	(0.012)	(0.012)
Postgraduate Degree	0.000	0.001	0.000	0.000
	(0.005)	(0.005)	(0.005)	(0.005)
Total Work Experience	-0.010**	-0.010**	-0.010**	-0.010**
	(0.003)	(0.003)	(0.003)	(0.003)
Network Ties	0.004**	0.004**	0.004**	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)
Ownership Concentration	0.006	0.006	0.006	0.005
	(0.018)	(0.018)	(0.018)	(0.018)
Eponymy (0/1)	0.019	0.022	0.019	0.018
	(0.115)	(0.115)	(0.115)	(0.115)
Institutional Shareholder (0/1)	-0.006	-0.007	-0.006	-0.006
	(0.025)	(0.025)	(0.025)	(0.025)
Lambda	-0.001	-0.001	0.001	0.001
	(0.028)	(0.028)	(0.028)	(0.028)
Inverse Mills Ratio	0.113	0.127	0.111	0.112
	(0.418)	(0.418)	(0.419)	(0.418)
Family Firm (0/1)	-0.003	0.019	-0.002	0.007
	(0.038)	(0.039)	(0.038)	(0.040)
Firm Age	-0.044	-0.045	-0.012	-0.014
	(0.041)	(0.041)	(0.042)	(0.042)
Industry Dummies	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES
Key Independent Variables				
H1a: Exp.-based Matching Competence	0.036***	0.040**	0.140**	0.142**
	(0.010)	(0.013)	(0.048)	(0.048)
H1b: Exp.-based Governance Competence	0.023*	0.042***	0.149***	0.144**
	(0.009)	(0.012)	(0.044)	(0.044)
Moderating Effects				
H2a: Exp.-Based Matching Competence x Family Firm		-0.005		0.012
		(0.019)		(0.019)
H2b: Exp.-Based Governance Competence x Family Firm		-0.047**		-0.029
		(0.018)		(0.018)
H3a: Exp.-Based Matching Competence x Firm Age			-0.034*	-0.036*
			(0.015)	(0.015)
H3b: Exp.-Based Governance Competence x Firm Age			-0.042**	-0.037**
			(0.013)	(0.014)
Constant	-0.088	-0.125	-0.186	-0.186
	(0.757)	(0.757)	(0.760)	(0.758)
Observations	9,130	9,130	9,130	9,130
Number of Firms	2,476	2,476	2,476	2,476
R-Squared Overall	0.024	0.025	0.026	0.026
R-Squared Between	0.062	0.064	0.066	0.068
R-Squared Within	0.023	0.023	0.024	0.024

Note: The coefficients for the industry and year dummies included in all regressions are not reported. Standard errors are in parentheses (clustered at the firm level). Analyses with the logarithm of total assets as an alternative measure of firm size yield identical results.
+ p < .10, * p < .05, ** p < .01, *** p < .001.

Table A9. Random-effects panel regressions for industry-adjusted sales growth [Subsample older than 27 years]

DV: Industry-Adjusted Sales Growth	(1)	(2)	(3)	(4)
Firm Size (t-1)	0.003	0.003	0.003	0.003
	(0.005)	(0.005)	(0.005)	(0.005)
Leverage (t-1)	-0.081	-0.082	-0.079	-0.080
	(0.105)	(0.105)	(0.105)	(0.105)
Leverage^2 (t-1)	0.048	0.049	0.047	0.047
	(0.070)	(0.069)	(0.070)	(0.069)
Bachelor's Degree	-0.013	-0.013	-0.013	-0.013
	(0.016)	(0.016)	(0.016)	(0.016)
Postgraduate Degree	0.005	0.005	0.005	0.005
	(0.007)	(0.007)	(0.007)	(0.007)
Total Work Experience	-0.000	-0.001	-0.000	-0.001
	(0.004)	(0.004)	(0.004)	(0.004)
Network Ties	0.001	0.002	0.001	0.002
	(0.002)	(0.002)	(0.002)	(0.002)
Ownership Concentration	-0.006	-0.006	-0.006	-0.006
	(0.031)	(0.031)	(0.032)	(0.031)
Eponymy (0/1)	-0.175	-0.175	-0.170	-0.171
	(0.206)	(0.205)	(0.206)	(0.205)
Institutional Shareholder (0/1)	0.008	0.009	0.007	0.008
	(0.043)	(0.043)	(0.043)	(0.043)
Lambda	0.014	0.014	0.013	0.013
	(0.043)	(0.043)	(0.043)	(0.043)
Inverse Mills Ratio	-0.587	-0.589	-0.571	-0.575
	(0.735)	(0.731)	(0.736)	(0.732)
Family Firm (0/1)	0.074	0.089	0.072	0.087
	(0.067)	(0.070)	(0.067)	(0.070)
Firm Age	0.067	0.067	0.070	0.069
	(0.074)	(0.074)	(0.075)	(0.074)
Industry Dummies	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES
Key Independent Variables				
H1a: Exp.-based Matching Competence	0.006	0.016	-0.021	-0.014
	(0.012)	(0.020)	(0.118)	(0.119)
H1b: Exp.-based Governance Competence	-0.006	0.008	0.052	0.058
	(0.010)	(0.019)	(0.101)	(0.102)
Moderating Effects				
H2a: Exp.-Based Matching Competence x Family Firm		-0.016		-0.017
		(0.024)		(0.025)
H2b: Exp.-Based Governance Competence x Family Firm		-0.021		-0.019
		(0.023)		(0.024)
H3a: Exp.-Based Matching Competence x Firm Age			0.007	0.008
			(0.031)	(0.031)
H3b: Exp.-Based Governance Competence x Firm Age			-0.015	-0.013
			(0.025)	(0.026)
Constant	0.970	0.966	0.927	0.930
	(1.334)	(1.326)	(1.345)	(1.337)
Observations	2,431	2,431	2,431	2,431
Number of Firms	712	712	712	712
R-Squared Overall	0.012	0.013	0.013	0.013
R-Squared Between	0.033	0.035	0.034	0.036
R-Squared Within	0.002	0.002	0.002	0.002

Note: The coefficients for the industry and year dummies included in all regressions are not reported. Standard errors are in parentheses (clustered at the firm level). Analyses with the logarithm of total assets as an alternative measure of firm size yield identical results.
+ p < .10, * p < .05, ** p < .01, *** p < .001.

Table A10. Random-effects panel regressions for industry-adjusted sales growth [Subsample younger than 11 years]

DV: Industry-Adjusted Sales Growth	(1)	(2)	(3)	(4)
Firm Size (t-1)	-0.022*	-0.022*	-0.022*	-0.022*
	(0.009)	(0.009)	(0.009)	(0.009)
Leverage (t-1)	-0.038	-0.028	-0.033	-0.024
	(0.154)	(0.153)	(0.157)	(0.156)
Leverage^2 (t-1)	0.072	0.066	0.069	0.064
	(0.102)	(0.101)	(0.104)	(0.103)
Bachelor's Degree	0.063	0.061	0.067+	0.064+
	(0.039)	(0.039)	(0.039)	(0.038)
Postgraduate Degree	0.004	0.006	0.004	0.006
	(0.011)	(0.011)	(0.011)	(0.011)
Total Work Experience	-0.022**	-0.020**	-0.021**	-0.020**
	(0.008)	(0.008)	(0.008)	(0.008)
Network Ties	0.006	0.006	0.006	0.006
	(0.004)	(0.004)	(0.004)	(0.004)
Ownership Concentration	-0.012	-0.010	-0.011	-0.009
	(0.043)	(0.043)	(0.043)	(0.043)
Eponymy (0/1)	-0.274	-0.255	-0.268	-0.250
	(0.277)	(0.275)	(0.280)	(0.279)
Institutional Shareholder (0/1)	0.089	0.085	0.089	0.084
	(0.064)	(0.064)	(0.065)	(0.065)
Lambda	-0.057	-0.057	-0.057	-0.057
	(0.052)	(0.052)	(0.052)	(0.052)
Inverse Mills Ratio	-0.921	-0.849	-0.898	-0.829
	(1.038)	(1.033)	(1.052)	(1.048)
Family Firm (0/1)	0.082	0.149	0.079	0.141
	(0.089)	(0.098)	(0.090)	(0.099)
Firm Age	-0.047	-0.056	0.043	0.028
	(0.099)	(0.098)	(0.118)	(0.117)
Industry Dummies	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES
Key Independent Variables				
H1a: Exp.-based Matching Competence	0.086***	0.100***	0.247	0.246
	(0.024)	(0.029)	(0.179)	(0.176)
H1b: Exp.-based Governance Competence	0.074***	0.106***	0.331*	0.343*
	(0.023)	(0.026)	(0.162)	(0.158)
Moderating Effects				
H2a: Exp.-Based Matching Competence x Family Firm		-0.038		-0.032
		(0.053)		(0.054)
H2b: Exp.-Based Governance Competence x Family Firm		-0.134**		-0.126*
		(0.051)		(0.053)
H3a: Exp.-Based Matching Competence x Firm Age			-0.081	-0.075
			(0.086)	(0.086)
H3b: Exp.-Based Governance Competence x Firm Age			-0.131+	-0.122
			(0.078)	(0.077)
Constant	2.012	1.853	1.787	1.648
	(1.890)	(1.881)	(1.914)	(1.906)
Observations	2,437	2,437	2,437	2,437
Number of Firms	799	799	799	799
R-Squared Overall	0.065	0.068	0.067	0.069
R-Squared Between	0.083	0.088	0.086	0.091
R-Squared Within	0.052	0.052	0.053	0.053

Note: The coefficients for the industry and year dummies included in all regressions are not reported. Standard errors are in parentheses (clustered at the firm level). Analyses with the logarithm of total assets as an alternative measure of firm size yield identical results.
+ p < .10, * p < .05, ** p < .01, *** p < .001.

Table A11. Random-effects panel regressions for industry-adjusted sales growth [Number of managerial jobs included as control]

DV: Industry-Adjusted Sales Growth	(1)	(2)	(3)	(4)
Firm Size (t-1)	-0.007+	-0.007+	-0.007+	-0.007+
	(0.004)	(0.004)	(0.004)	(0.004)
Leverage (t-1)	0.041	0.043	0.040	0.040
	(0.062)	(0.062)	(0.063)	(0.062)
Leverage^2 (t-1)	-0.013	-0.015	-0.013	-0.014
	(0.042)	(0.041)	(0.042)	(0.042)
Bachelor's Degree	0.004	0.004	0.004	0.003
	(0.012)	(0.012)	(0.012)	(0.012)
Postgraduate Degree	0.002	0.002	0.001	0.002
	(0.005)	(0.005)	(0.005)	(0.005)
Total Work Experience	-0.010**	-0.010**	-0.009**	-0.009**
	(0.003)	(0.003)	(0.003)	(0.003)
Network Ties	0.004**	0.004**	0.004**	0.004**
	(0.002)	(0.002)	(0.002)	(0.002)
Ownership Concentration	0.007	0.007	0.007	0.007
	(0.018)	(0.018)	(0.018)	(0.018)
Eponymy (0/1)	0.001	0.005	-0.000	0.001
	(0.114)	(0.114)	(0.115)	(0.114)
Institutional Shareholder (0/1)	0.005	0.004	0.005	0.004
	(0.025)	(0.025)	(0.025)	(0.025)
Lambda	-0.004	-0.004	-0.002	-0.002
	(0.028)	(0.028)	(0.028)	(0.028)
Inverse Mills Ratio	0.050	0.068	0.047	0.052
	(0.417)	(0.417)	(0.418)	(0.418)
Number of Managerial Jobs	-0.001	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Family Firm (0/1)	0.004	0.030	0.004	0.017
	(0.038)	(0.039)	(0.038)	(0.040)
Firm Age	-0.039	-0.040	-0.007	-0.010
	(0.041)	(0.041)	(0.042)	(0.042)
Industry Dummies	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES
Key Independent Variables				
H1a: Exp.-based Matching Competence	0.035***	0.042**	0.138**	0.139**
	(0.010)	(0.014)	(0.048)	(0.048)
H1b: Exp.-based Governance Competence	0.024**	0.045***	0.149***	0.143**
	(0.009)	(0.013)	(0.044)	(0.044)
Moderating Effects				
H2a: Exp.-Based Matching Competence x Family Firm		-0.011		0.005
		(0.019)		(0.020)
H2b: Exp.-Based Governance Competence x Family Firm		-0.051**		-0.034+
		(0.018)		(0.020)
H3a: Exp.-Based Matching Competence x Firm Age			-0.034*	-0.034*
			(0.015)	(0.015)
H3b: Exp.-Based Governance Competence x Firm Age			-0.042**	-0.035*
			(0.013)	(0.014)
Constant	0.008	-0.036	-0.085	-0.091
	(0.756)	(0.756)	(0.760)	(0.758)
Observations	9,257	9,257	9,257	9,257
Number of Firms	2,509	2,509	2,509	2,509
R-Squared Overall	0.024	0.025	0.026	0.026
R-Squared Between	0.062	0.066	0.067	0.069
R-Squared Within	0.021	0.021	0.022	0.022

Note: The coefficients for the industry and year dummies included in all regressions are not reported. Standard errors are in parentheses (clustered at the firm level). Analyses with the logarithm of total assets as an alternative measure of firm size yield identical results.
+ p < .10, * p < .05, ** p < .01, *** p < .001.

8.1.2   LinkedIn data-extraction approach

To assess the owners' experience-based competences, we built on the *bag-of-words approach* employed by Blohm et al. (2020), who assessed the managerial, entrepreneurial, and technical experience of founders via LinkedIn when studying the influence of business angels' biases and experience on their investment returns. Combining their approach with computational linguistic work (e.g., Kanze et al., 2021), we started to build our measures by creating evolving dictionaries based on Foss et al.'s (2021) theoretical paper. For the education section, we drew on the preexisting bag of words created by Blohm et al. (2020).

Specifically, we first created lists with the word stems of key verbs and nouns[28] from the descriptions and definitions of matching competence and governance competence discussed in Foss et al.'s (2021) article. For instance, we included "creative_" based on the definition stating that matching competence involves "foresight and creativity about valuable resource (re)configurations" (Foss et al., 2021: 310). We captured creativity in a context-independent manner as experience in putting new ideas together in new combinations likely also improves matching competence in different contexts (Amabile, 1988). We further manually coded a random sample of 100 LinkedIn profiles (using two coders with a high intercoder reliability of > 0.85) and collected keywords that were frequently used to describe matching- and governance-related activities based on face validity/comparison to the literature. After these steps, we had collected 44 words associated with matching experience and 41 words associated with governance experience. Following Kanze et al. (2021), in the next step, we increased the construct validity of our bag of words by presenting the words to a third coauthor who had not been involved in the previous steps. This coauthor independently judged and classified all of the words to determine if they related to matching, governance, or neither. We retained only those words for which all authors agreed on the categorization, which resulted in a dictionary

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[28] Given that we focused on German firms, we included both German and English words.

comprising 29 words for experience-based matching competence and 28 words for experience-based governance competence.

We measured experience in months by triangulating the descriptions of the individual positions with the reported lengths of positions.[29] Given the panel nature of our data, we calculated all measures for the years 2011 to 2018 (e.g., a dummy variable for a master's degree took the value of 1 in the year of graduation). Further, total work experience was calculated backwards from the focal year of the dataset and contained all the months an individual had been active in the labor market, including months they gained in both matching- and governance-related capacities as well as other work experience.[30]

We transferred the bag of words to a data-extraction algorithm and ran it for the 100 profiles we previously coded manually to assess the reliability of our approach. After two iterations of adding keywords and deleting homonyms, we reached a satisfactory Cronbach's alpha of at least .80 for both measures and concluded that the approach is reliable.

The final bags of words we employed are shown below. Note that the algorithm transformed all words to lowercase and deleted hyphens. For German words, their English translations were also included and vice versa, but we only report English words.

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[29] Some positions related to both the matching and governance bags of words (e.g., "founder and CEO" would contribute both to matching [founder] and governance [CEO] experience). If more than one type of experience was reported in one position, the months of experience were distributed equally across the respective categories.

[30] An example would be holding an administrative position without personnel responsibility where neither of these aspects are present.

Experience-based matching competence dictionary

("research_," "enginee_," "implement_," "found_," "innovation," "integrat_," "build_," "optimi_," "automation," "develop_," "cofounder," "creat_," "transformation," "acquisition," "testing," "launch_," "freelancer," "startup," "established," "conception," "patent," "expansion," "strateg_," "consult_," "marketing," "design_," "collaboration," "recruiting," "sell," "owner," "coordinat_")

Experience-based governance competence dictionary

("coordinat_," "cofounder," "director," "ceo," "cfo," "cio," "cmo," "coo," "cpo," "cro," "cto," "head," "operations," "partner," "lead_," "executive," "operations," "board," "officer," "vice," "chief," "control_," "monitor_," "coaching," "advisor," "supervisor," "manag_," "owner")

Education dictionaries[31]

Bachelor's ("bed," "beng," "ba," "bacoec," "bachelor," "bachelors," "bs," "bsc," "llb")

Master's or equivalent ("llm," "mfa," "mmus," "ma," "mag," "magister," "master," "masters," "meng," "mlaw," "msc," "dipl," "diplom")

MBA ("cfa," "emba," "iema," "imba," "m.b.a.," "mba")

PhD ("doctor," "dr," "phd," "ph.d.")

Experience-based timing competence dictionary (Additional analysis)

("acquisition," "launch," "selling," "plan_," "exit," "entry," "bought," "sold," "traded," "timed," "option," "derivative," "arbitrage," "process_," "finance," "export," "risk," "purchas_," "invest_," "procurement," "pricing," "transfer," "market")

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[31] Masters, MBA, and PhD are summarized in a single category, "postgraduate degree."

8.2 Appendix B (Chapter 3)

Table B1. First-stage model of the Heckman selection model—Factors predicting the likelihood of exit

Variables	Coefficients (Robust Errors)
Women Shares (Log)	-0.109***
	(0.010)
Firm Age (Log)	-0.059***
	(0.003)
Firm Size (Log)	-0.124***
	(0.002)
Family Firm (0/1)	-0.022***
	(0.005)
Institutional Shareholders (0/1)	0.107***
	(0.011)
Number of External Managers (Log)	0.160***
	(0.005)
Coefficient of Variation in Ownership	0.021***
	(0.005)
Leverage	-1.199***
	(0.030)
Leverage^2	0.885***
	(0.020)
ROA (Log)	-0.073***
	(0.002)
Number of Owners	-0.039***
	(0.002)
Percentage of Owner-Managers	-1.032***
	(0.008)
Industry Dummies	YES
Observations	1,910,583
Number Firms	434,554
Number Failures	169,532
Wald Chi-Squared	49,630***

Note: Robust standard errors are in parentheses; $+ p < .10$, $* p < .05$, $** p < .01$, $*** p < .001$.

Table B2. Random-effects panel regressions for sales growth [Restricted to firms not older than 10 years]

Dependent Variable: Sales Growth	(1)	(2)
Firm Age (Log)	-0.189***	-0.189***
	(0.003)	(0.003)
Firm Size (Log)	-0.064***	-0.064***
	(0.002)	(0.002)
Family Firm (0/1)	0.004	0.004
	(0.003)	(0.003)
Institutional Shareholders (0/1)	0.029***	0.030***
	(0.006)	(0.006)
Number of External Managers (Log)	-0.004	-0.004
	(0.004)	(0.004)
Coefficient of Variation in Ownership	-0.003	-0.003
	(0.003)	(0.003)
IMR (Survivorship Bias)	0.012	0.012
	(0.018)	(0.018)
Leverage	0.054	0.054
	(0.044)	(0.044)
Leverage^2	-0.132***	-0.132***
	(0.031)	(0.031)
ROA (Log)	-0.029***	-0.029***
	(0.001)	(0.001)
Number of Owners	0.001	-0.001
	(0.001)	(0.002)
Percentage of Owner-Managers	0.044***	0.044***
	(0.011)	(0.011)
Independent Variable		
Women Shares (Log)	-0.052***	-0.090***
	(0.006)	(0.017)
Moderating Effects		
Women Shares x Number of Owners		0.015*
		(0.006)
Country Fixed Effects	Y	Y
Industry Fixed Effects	Y	Y
Year Fixed Effects	Y	Y
Constant	1.275***	1.282***
	(0.054)	(0.054)
Observations	79,360	79,360
Number Firms	24,744	24,744
R-Squared Overall	0.136	0.136
R-Squared Between	0.150	0.150
R-Squared Within	0.188	0.188

Note: Robust standard errors are in parentheses (clustered at the firm level); + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table B3. Fixed-effects panel regressions for sales growth

DV: Sales Growth	(1)	(2)
Firm Age (Log)	-0.345***	-0.345***
	(0.007)	(0.007)
Firm Size (Log)	-0.253***	-0.253***
	(0.004)	(0.004)
Family Firm (0/1)	-0.009	-0.009
	(0.010)	(0.010)
Institutional Shareholders (0/1)	0.009	0.010
	(0.007)	(0.007)
Number of External Managers (Log)	-0.011***	-0.011***
	(0.003)	(0.003)
Coefficient of Variation in Ownership	0.003	0.003
	(0.006)	(0.006)
IMR (Survivorship Bias)	0.014	0.014
	(0.010)	(0.010)
Leverage	0.127**	0.127**
	(0.041)	(0.041)
Leverage^2	-0.065*	-0.065*
	(0.029)	(0.029)
ROA (Log)	-0.038***	-0.038***
	(0.001)	(0.001)
Number of Owners	0.001	-0.002
	(0.002)	(0.003)
Percentage of Owner-Managers	0.033**	0.032**
	(0.012)	(0.012)
Independent Variable		
Women Shares (Log)	-0.051**	-0.100**
	(0.017)	(0.032)
Moderating Effects		
Women Shares x Number of Owners		0.019+
		(0.010)
Country Fixed Effects	Y	Y
Industry Fixed Effects	Y	Y
Year Fixed Effects	Y	Y
Firm Fixed Effects	Y	Y
Constant	4.311***	4.320***
	(0.066)	(0.066)
Observations	171,338	171,338
Number Firms	42,673	42,673
R-Squared Overall	0.063	0.063
R-Squared Between	0.118	0.118
R-Squared Within	0.171	0.171

Note: Robust standard errors are in parentheses (clustered at the firm level); $+ p < .10$, $* p < .05$, $** p < .01$, $*** p < .001$.

Table B4. Survival model—Factors predicting the likelihood of exit [Restricted to firms not older than 10 years]

Variables	Coefficients (Robust Errors)	Coefficients (Robust Errors)
Women Shares (Log)	-0.262***	0.189
	(0.053)	(0.176)
Women Shares x Number of Owners		-0.186**
		(0.070)
Firm Age (Log)	0.227***	0.228***
	(0.024)	(0.024)
Firm Size (Log)	-0.183***	-0.182***
	(0.016)	(0.016)
Family Firm (0/1)	-0.007	-0.002
	(0.027)	(0.027)
Institutional Shareholders (0/1)	0.022	0.020
	(0.048)	(0.048)
Number of External Managers (Log)	0.245***	0.242***
	(0.031)	(0.031)
Coefficient of Variation in Ownership	0.034	0.032
	(0.024)	(0.024)
IMR (Survivorship Bias)	-0.634***	-0.635***
	(0.139)	(0.139)
Leverage	-1.811***	-1.814***
	(0.262)	(0.262)
Leverage^2	1.291***	1.290***
	(0.164)	(0.164)
ROA (log)	-0.114***	-0.114***
	(0.012)	(0.012)
Number of Owners	-0.136***	-0.103***
	(0.014)	(0.018)
Percentage of Owner-Managers	-1.859***	-1.862***
	(0.088)	(0.088)
Industry Dummies	YES	YES
Country Dummies	YES	YES
Observations	88,258	88,258
Number Firms	24,665	24,665
Number Failures	5,916	5,916
Wald Chi-Squared	2,751***	2,765***

Note: Robust standard errors are in parentheses; $+ p < .10$, $* p < .05$, $** p < .01$, $*** p < .001$; IMR was derived to address the selection bias when restricting the sample to firms that had at least one growth rate (i.e., at least two firm-year observations). Our results are robust when excluding IMR.

8.3 Appendix C (Chapter 4)

8.3.1 Exploratory evidence for Study 1

As an exploratory test, we repeated our mediation analysis with illusion of control as an alternative measure of collective efficacy. We followed Simon et al. (2000) and adapted three pre-existing items focusing on business events that entrepreneurs tend to mistakenly believe they can control to measure the entrepreneurial teams' illusion of control. The three items were "We could succeed at making this venture a success even though other teams would fail"; "Our skills are the most important determinant of our venture's success"; and "The strategies we as a team choose are the major determinant of our venture's success" ($\alpha = 0.89$). Our measures of illusion of control and collective efficacy were highly correlated ($r = 0.78$), suggesting that both relate to a latent factor—what we argue to be the teams' overestimation of their ability. The results of our mediation analysis remained very similar for this alternative mediator (indirect effect $\beta_{a \times b} = 17.28$; SE = 9.29; bias-corrected confidence interval: 95% CI [4.21 to 42.50]).

As an exploratory test, we re-ran the mediation analysis while specifying task conflict (i.e., another proxy for groupthink and the key construct in Study 2) as a second mediator. We found higher levels of task conflict (see Study 2 for items) in teams with higher levels of friendship ties (consistent with our theorizing that friends are more likely to openly express their opinions) but no statistical significance for the mediation effect. The indirect effect of collective efficacy remained significant when adding task conflict as a second mediator to the model, supporting the argument that teams with friendship ties escalate their commitment *despite* engaging in beneficial task conflict.

8.3.2 Exploratory evidence for Study 2

As an additional manipulation (and face-validity) check, we attempted to verify our theoretical reasoning that powerful team members (the leaders in the teams per our assignment) are more likely to dominate discussions. We thus followed Tost et al. (2013) and asked the participants to indicate the talking time in their discussions—both for themselves and their two team members—to test for the leaders' verbal dominance. Within the unequal power distribution condition, we identified an increased proportion of talking time for the leaders compared to the regular team members (Mean = 42.42%; SD = 13.99; i.e., descriptively more than the average of 33.33% if talking time was distributed equally). As an additional test, we thus calculated the standard deviation of each team member's reported talking time within each team and found a higher standard deviation (i.e., more unequally distributed talking time) in the unequal power distribution condition (Mean = 10.31; SD = 8.77) compared to the equal power distribution condition (Mean = 6.91; SD = 4.30; t = -1.49; p = 0.15). Although not significant, the effect size (Cohen's d = 0.49) corresponded to a medium and, therefore, meaningful effect (Cohen, 1992). These findings reproduce Tost et al.'s (2013) findings of leaders' verbal dominance and support our overall theoretical reasoning.

8.3.3 Exploratory evidence and materials for Study 3

As an exploratory test, we repeated our mediation analysis with illusion of control as an alternative measure of collective efficacy. We assessed how the participants perceived the teams' illusion of control using the three items developed by Simon et al. (2000) (see Chapter 8.3.1 for all items) (α = 0.81). Again, our measures of illusion of control and collective efficacy were highly correlated (r = 0.58), and we observed a similar indirect effect ($\beta_{a \times b}$ = 5.56; SE = 1.96, bias-corrected confidence interval: 95% CI [1.94 to 9.70]) as for collective efficacy.

Table C1. Vignette for Study 3—Manipulation of friendship ties

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Friendship Manipulation (Page 1)—Two Conditions

Imagine you founded a start-up with a team consisting of three people. **Your two co-founders are close friends of yours**. Your start-up invested 10 out of 12 million euros of the start-up's money into the development of a new product—a plane that cannot be detected by a conventional radar, in other words, a radar-blank plane. When the project is 50% completed, another firm begins marketing a plane that cannot be detected by radar. In addition, it is apparent that their plane is much faster and far more economical than the plane your start-up is building. You have the possibility to use the remaining 2 million euros of your start-up's money, and you have an offer for a loan for another 5 million euros that would allow your team to continue further. Failure of the project will result in your start-up going bankrupt.	Imagine you founded a start-up with a team consisting of three people. **Your two co-founders are colleagues that you met at a start-up competition. You consider your co-founders colleagues, but they are not your friends.** Your start-up invested 10 out of 12 million euros of the start-up's money into the development of a new product—a plane that cannot be detected by a conventional radar, in other words, a radar-blank plane. When the project is 50% completed, another firm begins marketing a plane that cannot be detected by radar. In addition, it is apparent that their plane is much faster and far more economical than the plane your start-up is building. You have the possibility to use the remaining 2 million euros of your start-up's money, and you have an offer for a loan for another 5 million euros that would allow your team to continue further. Failure of the project will result in your start-up going bankrupt.
Please choose a name for the venture and type it in the field below.	Please choose a name for the venture and type it in the field below.

Reinforcement of Friendship Manipulation and Task (Page 2)—Two Conditions

Imagine you meet the co-founders of the described start-up (**your close friends**) for a discussion on whether you should continue the project.	Imagine you meet the co-founders of the described start-up (**your colleagues**) for a discussion on whether you should continue the project.
Please take at least three minutes and imagine the discussion. Please try to mentally put yourself in the situation. Think about arguments **your close friends** could make in favor or against continuing the project and about your own arguments and reactions.	Please take at least three minutes and imagine the discussion. Please try to mentally put yourself in the situation. Think about arguments **your colleagues** could make in favor or against continuing the project and about your own arguments and reactions.
After imagining the situation, please answer the following questions.	After imagining the situation, please answer the following questions.

8.3.4   Exploratory evidence and materials for Study 4

As an exploratory test, we employed a scale for teams' open communication as an alternative mediator for our measure of task conflict. We decided to include this measure after finishing the face-to-face experiments, which is why we do not report this additional test for Study 2. We followed Jehn and Mannix (2001) and used three pre-existing items to ask the participants how openly team members communicated with each other. The items were "How much open discussion of issues was there in your team"; "To what degree was communication in your team open"; and "To what degree was conflict dealt with openly in your team?" ($\alpha = 0.86$) (rated on a seven-point Likert scale ranging from "1 = far below average" to "7 = far above average"). We observed a similar indirect effect for our alternative mediator of open communication as for the task conflict measure ($\beta_{a \times b} = 1.23$; SE = 0.85, bias-corrected confidence interval: 95% CI [0.04 to 3.22]).

We again checked whether our assumption holds that more powerful team members verbally dominate discussions in the context of escalation decisions. We thus followed Tost et al. (2013) and asked the participants to indicate the talking time for themselves and the other two team members in the discussion they had imagined. This time, we compared the self-reported talking time of the participants in both conditions. Consistent with our theorizing, we found elevated levels of self-reported talking time in the unequal power distribution condition (Mean = 44.04; SD = 14.99) compared to the equal power distribution condition (Mean = 35.42; SD = 9.38; $t = -5.27$; $p < 0.001$).

Table C2. Vignette for Study 4—Manipulation of the power distribution

Power Manipulation (Page 1)—Two Conditions	
Imagine you founded a start-up with a team consisting of three people. **You serve as a regular team member in the start-up. There is no hierarchy in your team, and you all have the same power.** Your start-up invested 10 out of 12 million euros of the start-up's money into the development of a new product—a plane that cannot be detected by a conventional radar, in other words, a radar-blank plane. When the project is 50% completed, another firm begins marketing a plane that cannot be detected by radar. In addition, it is apparent that their plane is much faster and far more economical than the plane your start-up is building. You have the possibility to use the remaining 2 million euros of your start-up's money, and you have an offer for a loan for another 5 million euros that would allow your team to continue further. Failure of the project will result in your start-up going bankrupt.	Imagine you founded a start-up with a team consisting of three people. **You serve as the leader in the start-up. There is a clear hierarchy in your team, and you have the highest power.** Your start-up invested 10 out of 12 million euros of the start-up's money into the development of a new product—a plane that cannot be detected by a conventional radar, in other words, a radar-blank plane. When the project is 50% completed, another firm begins marketing a plane that cannot be detected by radar. In addition, it is apparent that their plane is much faster and far more economical than the plane your start-up is building. You have the possibility to use the remaining 2 million euros of your start-up's money, and you have an offer for a loan for another 5 million euros that would allow your team to continue further. Failure of the project will result in your start-up going bankrupt.
Please choose a name for the venture and type it in the field below.	Please choose a name for the venture and type it in the field below.

Reinforcement of Power Manipulation and Task (Page 2)—Two Conditions	
Imagine you meet the co-founders of the described start-up for a discussion about whether you should continue the project.	Imagine you meet the co-founders of the described start-up for a discussion about whether you should continue the project.
Please take at least three minutes and imagine the discussion. Please try to mentally put yourself in the situation. Think about arguments your co-founders could make in favor or against continuing the project and about your own arguments and reactions. **Remember that you serve as a regular team member and that you have the same decision-making authority as the others.**	Please take at least three minutes and imagine the discussion. Please try to mentally put yourself in the situation. Think about arguments your co-founders could make in favor or against continuing the project and about your own arguments and reactions. **Remember that you serve as the leader and that you have more decision-making authority than the others and the final say.**
After imagining the situation, please answer the following questions.	After imagining the situation, please answer the following questions.