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Article — Published Version

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R&D Management

Provided in Cooperation with:

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Suggested Citation: Richter, Nele; Zacharias, Nicolas A. (2024) : Planting the seeds of innovation: Established companies' startup cooperation capability, its mechanisms, and innovation outcomes, R&D Management, ISSN 1467-9310, Wiley, Hoboken, NJ, Vol. 55, Iss. 3, pp. 952-973, <https://doi.org/10.1111/radm.12732>

This Version is available at:

<https://hdl.handle.net/10419/323827>

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Planting the seeds of innovation: Established companies' startup cooperation capability, its mechanisms, and innovation outcomes

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The phenomenon of established companies engaging in startup cooperation in expectation of improving their innovativeness has increased extensively within the last few years. While some companies benefit considerably, others seem to fail at startup cooperation. Bridging cooperation research and dynamic capabilities, this paper sheds light on established companies' startup cooperation capability as important dynamic capability to succeed at startup cooperation. We conceptualize startup cooperation capability adapting alliance capability approaches from traditional cooperation research to fit startup cooperation. Furthermore, this study examines how startup cooperation capability impacts established companies' success in finding potential new startup partners and the efficiency with which startup cooperation activities are coordinated. Through these mechanisms, the study analyzes how startup cooperation capability consequently improves new product innovativeness. In addition, we investigate the moderating effects of resource availability as well as company formalization. To test the hypotheses, we analyze survey data from 195 startup cooperation managers who work at established companies by applying covariance-based structural equation modeling. The results suggest that startup cooperation capability has a positive impact on outreach success, which in turn positively affects new product innovativeness. The relationship between startup cooperation capability and outreach success is strengthened by resource availability. In contrast, startup cooperation capability is negatively associated with coordination efficiency, and this effect is weakened by the influence of company formalization. Summed up, the study shows that startup cooperation capability can improve the innovation outcomes of startup cooperation and illustrates how it can help established companies to pursue startup cooperation successfully.

1. Introduction

Startups are said to be a source of innovation (Weiblen and Chesbrough, 2015; Remneland Wikhamn, 2020; Wagner and Kurpjuweit, 2024). Oftentimes, they are young and flexible companies (Rosenbusch et al., 2011; Homfeldt et al., 2019), generating innovative ideas and developing the latest technologies (Gans and Stern, 2003). Many established companies can only dream of this entrepreneurial spirit and innovativeness, facing their own inertia as product of bureaucracy, lengthy decision processes, and long-established structures (Ford et al., 2010; Hogenhuis et al., 2017; de Groote and Backmann, 2020). For this reason, the potential of established company-startup cooperation has come into focus as highly promising opportunity to enhance an established company's innovativeness (Homfeldt et al., 2019; Shankar and Shepherd, 2019; Wagner and Kurpjuweit, 2024). However, despite established companies putting great efforts in startup cooperation, managers in many companies are dissatisfied, as their high expectations are often not met (Weiblen and Chesbrough, 2015; Basu et al., 2016; Prashantham and Madhok, 2023). In contrast, other established companies seem to be highly successful with their startup cooperation efforts.

Researchers as well note that some established companies have substantial difficulties with executing startup cooperation effectively (Kohler, 2016; Kruft et al., 2018), even though they generally agree on the beneficial character of established company – startup cooperation specifically regarding established companies' innovativeness (e.g., Rothaermel, 2001b; Dushnitsky and Lenox, 2005; Andersson and Xiao, 2016). In traditional cooperation research targeting cooperation ties between two or more established companies, dynamic capabilities play an important role in explaining why some companies succeed with their alliances or cooperation efforts, while others fail to do so (for an overview, see Kohtamäki et al., 2018). The perception of many companies failing with their startup cooperation efforts while others clearly benefit raises the question, which capabilities established companies need to conduct startup cooperation successfully.

Despite a high scholarly interest in the topic, there appears to be a scarcity of studies examining the necessary capabilities for startup cooperation, how exactly such capabilities influence relevant parameters of managing startup cooperation and eventually, the desired outcomes (Dushnitsky and

Lenox, 2005; Homfeldt et al., 2019). There are only some initial links of dynamic capabilities and startup cooperation literature (e.g., Zaremba et al., 2017; Enkel and Sagmeister, 2020; Steiber and Alänge, 2021; Wagner and Kurpjuweit, 2024), investigating the acquisition of new dynamic capabilities through startup cooperation and capabilities specifically in buyer–supplier relationships. However, a universal approach to examine established companies' capabilities to cooperate with startups successfully comprising different settings as well as insights on relevant internal mechanisms of the capability leading to desired outcomes is still missing.

Such a comprehensive approach is much needed since startup cooperation as strategic action requires the abilities to reach out to a multitude of startups, select the most promising ones as partners, and manage a resulting portfolio of startup partners (Weiblen and Chesbrough, 2015). Furthermore, startup cooperation often involves different cooperation forms (Kohler, 2016), requiring high efforts regarding strategic alignment as well as coordination of the individual startup cooperation ties. We suspect that the complexity of startup cooperation and its distinctiveness from traditional cooperation has been underestimated by scholars as well as practitioners. Against this background, we propose that established companies need dynamic capabilities involving higher-level activities (Teece, 2014) to orchestrate all the tasks necessary for succeeding at startup cooperation.

With our investigation, we address this research gap to add to the understanding of the abilities necessary for startup cooperation and thus adapt alliance capability approaches from traditional cooperation literature (Lambe et al., 2002) to fit the specific context of startup cooperation. We denote the resulting adapted capability *startup cooperation capability* (SCC), defined as the ability of an established company for initiating, developing, and managing startup cooperation to improve the company's innovativeness.

Next to this adaption resulting in SCC, we investigate the mechanisms of SCC that lead to new product innovativeness as well as relevant contingency factors to allow a better understanding. One of the main challenges of startup cooperation is finding and selecting fitting startups as possible future cooperation partners. Thus, we investigate outreach success, which reflects the degree to which a company is able to generate a pool of potential startup partners, as the first important mechanism of SCC through which the established company's new

product innovativeness is influenced. Considering a potentially high number of startup cooperation partners which is associated with a high level of coordination effort (Berchicci, 2013; Hogenhuis et al., 2017), we examine coordination efficiency as second mechanism variable in between SCC and new product innovativeness. In combining our conceptualization of SCC with these factors that mirror how established companies handle the major challenges specific to startup cooperation, we strive to answer the research question: *How can startup cooperation capability impact outreach success and coordination efficiency and consequently improve new product innovativeness?*

With our study we contribute to extant literature in several ways. First, we adapt the well-established concept of alliance management capability in traditional cooperation literature (Lambe et al., 2002) to the context of startup cooperation. This results in a dynamic capability called SCC, which specifically comprises the abilities of established companies concerning startup cooperation. Thereby, we contribute to a better understanding of how established companies can accomplish their aspired-to innovation outcomes through startup cooperation. As startups are known to be an important source of innovativeness (Gans and Stern, 2003; Das and He, 2006; de Groote and Backmann, 2020), utilizing this potential is highly desirable for established companies. From a theoretical view, our conceptualization of SCC can serve as a basis for further studies in this growing field of research.

Second, drawing on the concept of dynamic capabilities we provide insights into the mechanisms of how SCC affects established companies' internal processes of startup cooperation. These mechanisms are of great interest considering startup cooperation differs distinctly from traditional cooperation, for example, due to the higher number of individual cooperation partners (Weiblen and Chesbrough, 2015). Thus, insights on SCC's influence on outreach success can help with the understanding of how to find that high number of startup partners in the first place. Findings on SCC's effect on coordination efficiency are also useful for practitioners in order to grasp a realistic picture of the efforts necessary for success.

Third, additionally to examining the mechanisms of SCC, we investigate two important contingency factors which correspond to known problems of startup cooperation initiatives implemented in business practice. Anecdotal evidence, as well as experts we consulted on this topic, suggests that firms often have very few resources for startup cooperation. Therefore, we examine resource availability

available for startup cooperation as first contingency factor. Furthermore, the high degree of formalization and bureaucracy of established companies contrasts sharply with startups' flexibility and low formalization level, which is widely known to be challenging when these two types of companies interact (Hogenhuis et al., 2017). For this reason, we are adding company formalization as a second moderating variable to the scope of our study. By examining the role of these moderators in the mechanisms of SCC, we offer detailed knowledge on the internal company environment necessary to fully benefit from SCC.

2. Literature review

The theoretical approach of dynamic capabilities addresses the question of "how firms achieve and sustain competitive advantage" (Teece et al., 1997, p. 509). Following previous research, we understand dynamic capabilities as a company's "ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 516). Taking a close look at the literature on capabilities in an interorganizational context (please see Table 1 for an overview), the majority of studies uses a rather generic approach. Mostly, they refer to the capability examined as "alliance capability" (e.g., Anand and Khanna, 2000; Kale et al., 2002; Draulans et al., 2003), "alliance management capability" (e.g., Rothaermel and Deeds, 2006; Schreiner et al., 2009; Schilke and Goerzen, 2010), or "relational capability" (e.g., Lorenzoni and Lipparini, 1999; Capaldo, 2007; Helfat et al., 2007). These studies focus, for example, on how to develop such capabilities (e.g., Anand and Khanna, 2000; Rothaermel and Deeds, 2006; Heimeriks and Duysters, 2007), or on the mechanisms of how these capabilities work (e.g., Helfat et al., 2007; Schreiner et al., 2009; Schilke and Goerzen, 2010). However, these more general studies do not focus on a certain cooperation mode or specific frame conditions of a cooperation.

Next to that more general research on alliance capabilities, several studies examine a more specific interorganizational capability. For example, Zollo and Singh (2004) analyze the integration capability needed in acquisitions as a specific cooperation mode. This study strikingly shows the necessity of a capability approach incorporating the specific characteristics of highly specific cooperation settings. An acquisition is hardly comparable to joint ventures or licensing agreements and involves very specific complexities and requirements, even though all three are modes of

Table 1. Literature review

	Interorganizational capability concept	Bridging dynamic capabilities and startup cooperation
Exemplary studies using generic approaches		
Anand and Khanna (2000), Kale et al. (2002), Draulans et al. (2003), Kale and Singh (2007), Heimeriks and Duysters (2007), Robson et al. (2019)	Alliance capability	–
Rothaermel and Deeds (2006), Schreiner et al. (2009), Schilke and Goerzen (2010), Leischnig et al. (2014), Kauppila (2015)	Alliance management capability	–
Wittmann et al. (2009)	Alliance competence	–
Lorenzoni and Lipparini (1999), Helfat et al. (2007), Capaldo (2007), Paulraj et al. (2008)	Relational capability	–
Lambe et al. (2002)	Joint alliance competence	–
Mishra and Shah (2009)	Collaborative competence	–
Exemplary studies examining more specific interorganizational capability settings		
Zollo and Singh (2004)	Integration capability	–
Lütjen et al. (2019)	Ecosystem-related capabilities	–
Donbesuur et al. (2021)	Postformation alliance capabilities	–
Johnsen and Ford (2006)	Small suppliers' interaction capabilities	Small suppliers might be startups, but do not have to be
Studies with dynamic capability and startup cooperation focus		
Enkel and Sagmeister (2020)	–	Capability development through corporate venturing
Steiber and Alänge (2021)	–	Capability development through startup cooperation
Zaremba et al. (2017)	New venture partnering capability	First approach of conceptualizing a distinct capability to interact with startups, in this case specifically for buyer–supplier relationships
Wagner and Kurpjuweit (2024)	Dynamic new venture partnering capabilities	Second approach of examining distinct capabilities to interact with startups, also specifically for buyer–supplier relationships
Our study	Startup cooperation capability	Comprehensive approach to examining established companies' capabilities to cooperate with startups successfully comprising different settings

cooperation. Therefore, a differentiated view on the necessary capabilities is highly important for the great variety of different cooperation settings and frame conditions.

To add another perspective, the literature can be differentiated between studies focusing solely on a focal company pursuing cooperation, on dyads, or on a network of cooperation partners. Focusing on a single company, a cross-alliance comparison on a company level can help the focal company to evaluate and improve their alliance capabilities (Draulans et al., 2003). Some studies describe alliance portfolios as accumulated alliance experience

of a focal company (e.g., Anand and Khanna, 2000; Kale et al., 2002). Others analyze a whole network of cooperation ties and the impact of different network architectures (Capaldo, 2007). However, these approaches do not cover the specific phenomenon of startup cooperation.

Startup cooperation differs vastly from other types of interorganizational cooperation, mostly due to the great heterogeneity of the cooperating partners (Das and He, 2006; Homfeldt et al., 2019; Prashantham and Madhok, 2023). Due to this specificity and resulting specific requirements, generic approaches of alliance capabilities cannot be

transferred directly to startup cooperation but need to be reconsidered and adapted. While some studies bridge dynamic capabilities and startup cooperation examining the capabilities as outcomes of startup cooperation (Enkel and Sagmeister, 2020; Steiber and Alänge, 2021), only two initial approaches of analyzing the capabilities necessary to pursue startup cooperation were identified (Zaremba et al., 2017; Wagner and Kurpjuweit, 2024). However, both of these studies examine only one specific case of startup cooperation, which is buyer–supplier relationships, leaving the need for a comprehensive approach to examine established companies' capabilities to pursue startup cooperation in different settings untouched.

3. Theoretical foundation

The studies of Wagner and Kurpjuweit (2024) and of Zaremba et al. (2017) highlight that a distinct view on startup cooperation is indisputable since it differs substantially from traditional cooperation.¹ We refer to traditional cooperation as general interorganizational cooperation which has been researched for about four decades and does not include startup cooperation specifically. A first major difference lies in the great heterogeneity of the partners (Das and He, 2006; Homfeldt et al., 2019) resulting in a higher risk of culture clashes, misunderstandings, and failing operative interaction (Gulati et al., 2012). Second, a multitude of startup partners is needed as startups “are less important individually [...] but collectively act to shift the [established companies'] market position” (Weiblen and Chesbrough, 2015, p. 83), which entails high coordination needs. Third, the goals of startup cooperation are often vaguer than in traditional cooperation, for example, “technology transfer” (Alvarez and Barney, 2001) or startups' “innovative potential” (Dushnitsky and Lenox, 2005; Zaremba et al., 2017), adding up to the high complexity of startup cooperation.

Consequently, using a dynamic capability approach from traditional cooperation research is not sufficient to meet the requirements of startup cooperation. However, a comprehensive approach examining established companies' capabilities specifically for startup cooperation and covering a multitude of different startup cooperation forms is still lacking. These different forms include cooperation modes from very weak ties such as licensing agreements to very strong ties as in mergers and acquisitions. Furthermore, cooperation forms specific to startup cooperation such as accelerator programs,

incubator programs, or corporate venture capital need to be considered (e.g., Cao et al., 2024; Del Sarto et al., 2025). Thus, this study aims at closing that gap in adapting the concept of alliance capability from traditional cooperation research to fit startup cooperation, resulting in the dynamic capability SCC.

As basis for SCC, we build on a pool of traditional cooperation studies that cover a multitude of perspectives and focal points (e.g., Wang and Rajagopalan, 2015; Forkmann et al., 2018; Kohtamäki et al., 2018). Lambe et al.'s (2002) seminal work proposing the conceptualization of “joint alliance competence” as “organizational ability for finding, developing, and managing alliances” (Lambe et al., 2002, p. 143) is well-established and has often been used in subsequent research (e.g., Wittmann et al., 2009; Zacharias et al., 2020; Bicen et al., 2021) and serves as a theoretical base for our study. Drawing on the three facets of Lambe et al.'s (2002) approach – alliance experience, partner identification propensity, and alliance manager development capability – we adapt each of these facets considering the fundamental differences between startup and traditional cooperation. Figure 1 graphically demonstrates the resulting three-dimensional conceptualization of SCC. In addition to adapting the three dimensions, we expand the theoretical approach of Lambe et al. (2002) and differentiate between the strategic and the operational levels to mirror previous research showing that dynamic capabilities cover both strategic aspects (Teece et al., 1997; Eisenhardt and Martin, 2000) and operational processes (Zollo and Winter, 2002; Teece, 2007). With this expansion, we strive to add a holistic view to the understanding of SCC involving the unique objectives of startup cooperation on the strategic level and the specific characteristics of interaction processes on the operational level. The three dimensions of SCC are conceptualized as startup cooperation experience, startup search and selection competence, and startup portfolio management competence.

3.1. Startup cooperation experience

Experience is a well-established factor for the evaluation of companies' alliance competences (Reuer and Zollo, 2005; Heimeriks and Duysters, 2007), often conceptualized as joint experience in a specific alliance of two companies that get to know each other in a cooperation and, thereby, improve their interaction (Lambe et al., 2002). However, for startup cooperation this presumption of experience as an “acquaintance process” is less applicable because of the multitude of startup partners needed (Alvarez and Barney, 2001; de Groote and

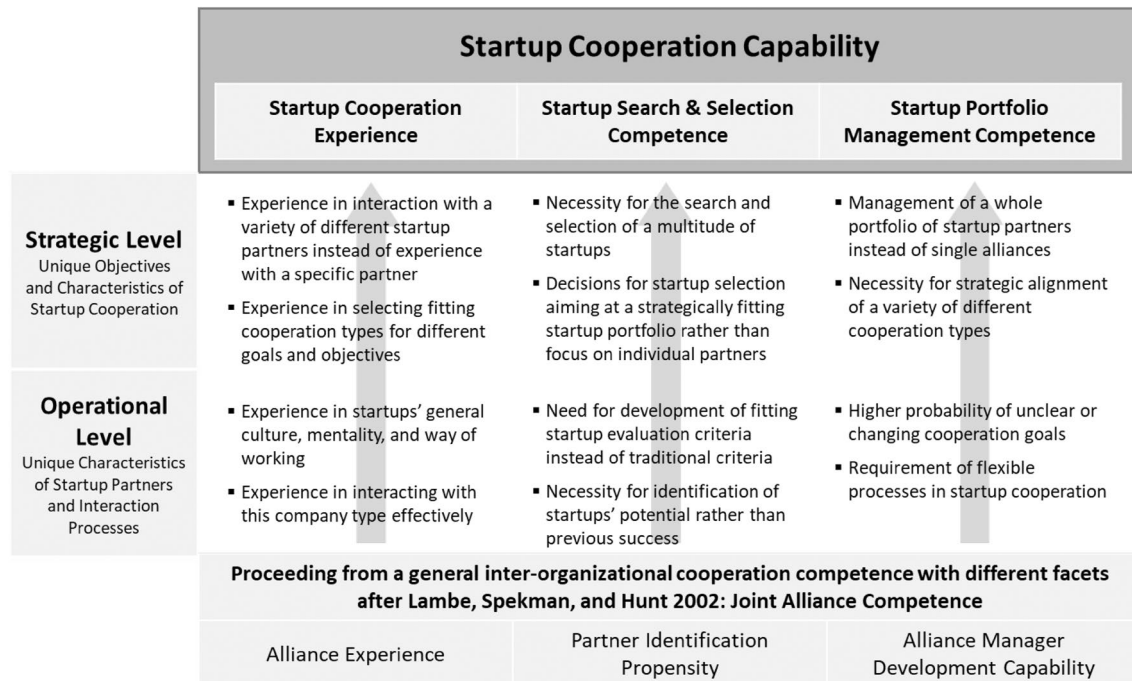


Figure 1. Conceptual overview.

Backmann, 2020). Established companies therefore need to have the ability to adjust well to any startup and interact effectively with them. Thus, this facet of SCC refers to established companies' experience of getting to know startup cooperation processes and mechanisms, independent from individual startup partners.

Established companies and startups are very different company types, which can lead to a clash of corporate cultures (Barringer and Harrison, 2000). While colliding company cultures are already an issue in traditional cooperation, this problem is even magnified in startup cooperation due to the fundamental differences in company structure, processes, resource endowment, agility, and so forth. Therefore, from an operational level, getting to know startups' specific characteristics is critical, since it can help avoiding potential negative effects, such as misunderstandings caused by cultural differences or challenges for joint work due to different working paces (Weiblen and Chesbrough, 2015). Thus, established companies need knowledge on how startups work and gain experience regarding an effective interaction with them.

3.2. Startup search and selection competence

As selecting the "right" alliance partner has been described as crucial in cooperation literature (e.g.,

Kale and Singh, 2007; Shah and Swaminathan, 2008; Cummings and Holmberg, 2012), the ability of established companies to search for startup partners and select the most fitting ones builds the second component of SCC. The central strategic objective of startup cooperation is to continuously learn about a variety of potentially interesting technologies, business models, etc. through startups (de Groote and Backmann, 2020). Therefore, from a strategic perspective identifying a sufficient quantity of relevant startups is central. Contrary to traditional cooperation, potential new startup partners are not "known" players of the market. Instead, they are hard to find and to evaluate, as they usually have no references or financial records.

This results in major challenges on the operational level: The extent of specific search and selection processes required for finding startups is much greater than in traditional cooperation (Kurpjuweit et al., 2021). There exists a multitude of startups in various industries – some more visible than others – but altogether making the task of identifying the best cooperation partners anything but trivial. After successfully identifying interesting startups, the process of selecting the most fitting ones is also nontrivial, as traditional selection criteria may not be applicable for startup cooperation (Kurpjuweit et al., 2021). Startups may not have a record of success to use for evaluation, and financial data may be insufficient as a central selection criterion.

Moreover, the evaluation of new technologies is a complex task.

3.3. Startup portfolio management competence

A unique characteristic of startup cooperation that emerges when firms have a high number of startup partners (Weiblen and Chesbrough, 2015) is the necessity of managing a whole startup portfolio resulting in great management efforts required (Berchicci, 2013; Hogenhuis et al., 2017). Kale and Singh (2009, p. 46) find that a company needs to learn “how to manage their alliance portfolio as a whole.” From a strategic view, this includes aligning all individual cooperation ties with the established firm’s overall strategic objectives. Impeding this task is the fact that the goals of startup cooperation are often much fuzzier than in traditional cooperation since, for example, an innovative technology possessed by a startup needs to be matched to a potential business case or product optimization before a precise goal of that cooperation can be defined. Thus, well-trained startup cooperation managers capable of aligning a multitude of individual startup cooperation initiatives with the “bigger picture” are required.

From an operational view, this leads to tremendous complexity of managing the startup portfolio and requires specific management competences. Due to the vagueness of targets, startup cooperation can require very flexible processes with the opportunity of adjusting the goals. While startups are usually very flexible due to their young age and low level of bureaucracy (Homfeldt et al., 2019), this need for

flexibility is much more challenging for established companies. For often bureaucratic established companies with oftentimes time-consuming decision processes, the ability to manage a startup portfolio with flexible changes and adjustments represents a major component of SCC.

4. Study framework and hypotheses

Figure 2 depicts our study framework with SCC as main independent variable and the focal aspect of our research. As outlined before, this study aims to understand the mechanisms of how SCC impacts the processes of an established company aimed at startup cooperation. Therefore, the two main direct effects within the framework analyze the relationship between SCC and the relevant internal mechanism variables, outreach success, and coordination efficiency. Searching for promising startups and selecting the most fitting ones as partners is a key challenge of startup cooperation. Outreach activities are aimed at identifying and starting to interact with a sufficient number of fitting startups as possible future cooperation partners, and thus, outreach success reflects whether an established company is able to generate a sufficient pool from which to choose potential startup partners. The second key outcome of SCC is coordination efficiency, which is critical due to the importance of managing cooperation initiatives and potentially high costs associated with this task. Herein, we define coordination efficiency as the efficiency with which established companies manage their whole portfolio of startup partners.

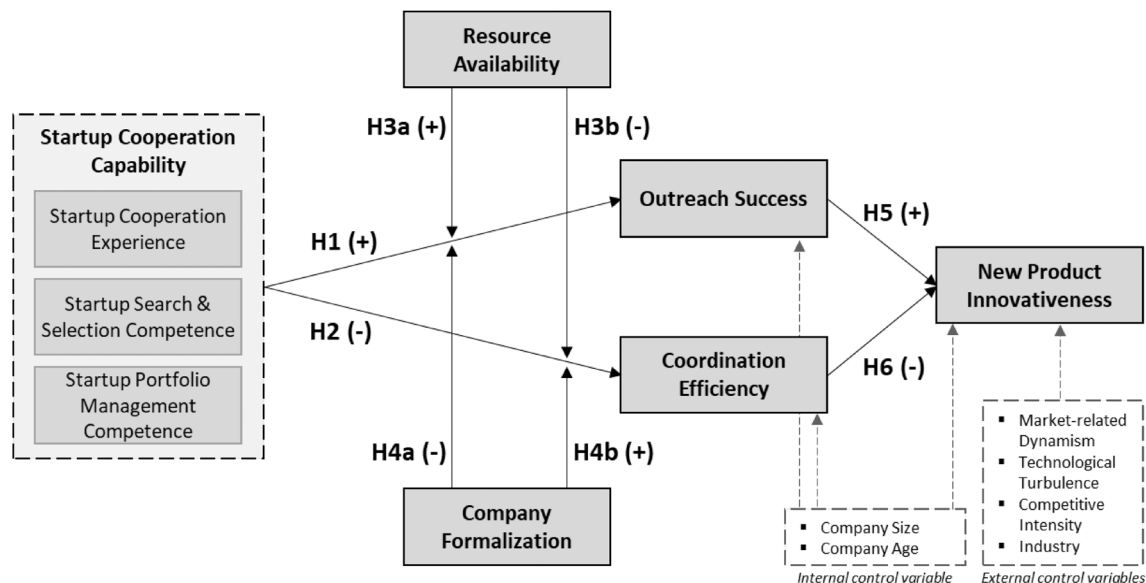


Figure 2. Study framework.

To generate additional insights on important contingency factors corresponding to known hurdles of startup cooperation as stated in the introduction section, we integrate two moderating variables in the framework, namely, resource availability and company formalization. Resource availability is understood as the excess resources of an established company that are available specifically for the purpose of startup cooperation. Company formalization is seen as the degree of rules and formal procedures used to control activities (Patterson et al., 2005) within an established company. Established companies' main motive to engage with startups is increased innovativeness; therefore, our framework is completed by the dependent variable new product innovativeness, which refers to the degree of newness of the products developed or improved in the context of startup cooperation.

4.1. Direct effects of startup cooperation capability

Identifying cooperation opportunities, as a first step in forming cooperation ties, is known to be a key factor of cooperation success (Nijssen et al., 2001). Sensing and seizing cooperation opportunities earlier than competitors increases the opportunities to generate superior benefits from cooperation (Leischnig and Geigenmüller, 2018) and thus is an important factor of startup cooperation. In fact, the ability to find and reach out to possible future cooperation partners is even more important in startup cooperation, because a higher number of partners is needed (Weiblen and Chesbrough, 2015). Therefore, outreach success is a key outcome of SCC.

Established companies possessing SCC have a greater likelihood of outreach success for multiple reasons. First, established companies with a certain experience base of cooperating with startups are likely to have connections to the startup scene and can build a network of startup partners (Kohler, 2016). Access to a startup network improves the probability for established companies to notice promising new startups and improves the chances of finding solutions to specific problems or technological challenges (Kohler, 2016). Furthermore, an established company can position itself as an attractive business partner and thereby attract further potential partners (Prashantham and Madhok, 2023).

Second, established companies possessing SCC have a higher awareness of the importance of identifying high-potential startups and the constant

search for novel startup partners. This awareness subsequently leads to a greater likelihood of outreach success (Monteiro and Birkinshaw, 2017). Third, established companies with SCC have skilled managers with high expertise in a startup cooperation context. Through this experience and expertise, these managers are more likely to successfully identify startups with the most promising technology or business model that might fit well with the focal company. Building on these arguments, we hypothesize:

Hypothesis (H1) Startup cooperation capability positively affects the outreach success of an established company.

Startup cooperation is primarily an exploratory activity (Weiblen and Chesbrough, 2015; Kohler, 2016), aiming at identifying and utilizing new opportunities, innovative technologies, and novel business model approaches. Rooted in the novelty and unfamiliarity of the startups' knowledge brought into the cooperation, exploratory activities like the development and implementation of ideas or experimentation in established companies are essential (Belderbos et al., 2010; Wadhwa and Basu, 2013). While exploration and creativity are desired goals of startup cooperation (Weiblen and Chesbrough, 2015; Kohler, 2016), they are also "a source of managerial stomachache" (Leenders et al., 2007, p. 166) due to concerns about control and efficiency.

The coordination of joint work spanning company boundaries is known to be a major challenge of cooperation and can be described as the "mechanics of bringing together partners' contributions" (Gulati et al., 2012, p. 532). This demands high effort and involves high costs (Berchicci, 2013; Contractor and Reuer, 2014), which is why established companies strive for coordination efficiency in order to keep the costs and needed management resources rather low. For the case of startup cooperation, this involves a conflict because, on the one hand, a high degree of exploration, flexibility, and creativity are essential for its success. On the other hand, these factors are considerably hindering efficiency, since they are by definition not construed for, for example, following a strict time schedule and efficiently reaching pre-defined goals. Especially for a whole portfolio of startup partners, low levels of efficiency can quickly lead to elevated costs and high resource requirements.

Summing up, while companies possessing SCC focus on encouraging creativity, they at the same time accept the fact that target achievement might

not always be straight-forward. Instead, startup cooperation processes need to entail a certain degree of flexibility even if that means a loss of coordination efficiency. Thus, with the acceptance and encouragement of the explorative character of startup cooperation, established companies simultaneously concede a lower level of coordination efficiency regarding startup cooperation activities. Therefore, we deduce the following hypothesis:

Hypothesis (H2) Startup cooperation capability negatively affects the coordination efficiency of startup cooperation initiatives of an established company.

4.2. Moderating effects of resource availability and company formalization

As mentioned previously, interorganizational cooperation is generally associated with high efforts and high costs (Berchicci, 2013; Contractor and Reuer, 2014), requiring adequate resource allocation. This is especially relevant for startup cooperation because technology alliances often demand particularly high monitoring and controlling efforts. Moreover, a multitude of cooperation partners involves high coordination costs (Faems et al., 2010). Thus, to fully utilize the positive effects of SCC on outreach success, an established company needs to provide a sufficient number of resources for startup cooperation. Having fewer resource constraints offers more room for creativity, idea development, and experimentation (Nohria and Gulati, 1997; Weiss et al., 2017).

Only in the setting of adequate resource endowment, the positive impact of SCC on outreach success can fully unfold without limitations due to resource constraints. Thus, an established company with resource availability specifically available for startup cooperation can implement more initiatives, provide more startup managers to interact with startups, etc., and thereby realize the full potential of SCC. Therefore, we posit that the positive effect of SCC leading to a higher level of exploration in the form of outreach success is increased by a higher number of resources available, leading to the following hypothesis:

Hypothesis (H3a) Resource availability positively moderates the relationship between startup cooperation capability and the outreach success of an established company.

This expected higher level of exploration in startup cooperation initiatives associated with

resource availability also influences the negative relationship between SCC and coordination efficiency for similar reasons. Resources available for startup cooperation facilitate the explorative character of startup cooperation, leading to more space for creativity, experimentation, and development of ideas (Nohria and Gulati, 1997; Weiss et al., 2017). We argued that established companies possessing SCC recognize the exploratory character of startup cooperation and accept a lower level of coordination efficiency associated with a high degree of exploration. This tendency is even intensified with resource availability, as higher amounts of slack resources are associated with a higher share of exploratory activities (Tabesh et al., 2019). Thus, a higher number of available resources for startup cooperation allows the implementation of more creative and exploratory initiatives while at the same time it decreases the need for efficiency. Therefore, we expect resource availability to increase the negative impact of SCC on coordination efficiency and propose the following:

Hypothesis (H3b) Resource availability negatively moderates the relationship between startup cooperation capability and the coordination efficiency of startup cooperation initiatives of an established company.

The differing cultures of established companies and startups are a known hurdle of the cooperation between the two company types, potentially causing problems in interaction processes (Hogenhuis et al., 2017). One of these cultural aspects is company formalization, which becomes visible in the degree of rules and formal procedures (Patterson et al., 2005). Formalization tends to be significantly higher in established companies than in startups (Weiblen and Chesbrough, 2015), which can be challenging already in the early phase of reaching out and identifying potentially fitting startups: informal contacts play an important role in the entrepreneurial scene; the high degree of formalization typical in established companies could hinder attempts to interact with startups informally and therefore decrease the number of cooperation opportunities.

In addition, established companies' high degree of formalization commonly involves highly bureaucratic evaluation and decision processes before a startup cooperation is formed. The fact that startups often do not fit traditional and well-established (financial) evaluation criteria (Zaremba et al., 2017) might even intensify this aspect. Startup managers often view a long time period before an official start of the cooperation very negatively, and concerns of a

similarly slow progress within the cooperation might arise (Hogenhuis et al., 2017). For startups, “decision speed is crucial” (Wagner and Kurpjuweit, 2024, p. 7) as they have only limited resources and opportunities to succeed at their new business. Thus, in the worst case with too long and bureaucratic processes on the established company side, startups might end relationships before they even start. Therefore, we propose that a high level of formalization within an established company negatively influences the relationship between SCC and outreach success. Formally:

Hypothesis (H4a) Company formalization negatively moderates the relationship between startup cooperation capability and the outreach success of an established company.

While established companies’ high degree of formalization can be a risk regarding their relationship to startups, it can also help in coordinating interorganizational relationships (e.g., Zollo and Winter, 2002; Kale and Singh, 2007, 2009). Formalization often manifests in extensive written rules, procedures, instructions, and so on (Pugh et al., 1968), leading to many established firms using codified management tools such as guidelines, checklists, and manuals that can serve as helpful tools for the coordination of cooperation (Zollo and Winter, 2002; Kale and Singh, 2009).

Therefore, we argue that established companies with a higher degree of formalization are more likely to use such codified management tools in the context of startup cooperation. We propose that using such tools is particularly helpful in managing startup cooperation, because formalized processes help firms manage the interaction with a high number of startup partners and a variety of different cooperation forms more efficiently. More formalization might therefore help companies to better structure and manage startup cooperation, which as a primarily explorative activity otherwise is characterized by rather flexible processes. Hence, established companies’ formalization might weaken the negative relationship between SCC and coordination efficiency. Thus, we suggest that formalized established companies with high SCC are more likely to reach a higher level of efficiency regarding the coordination of their startup partners. Therefore, we hypothesize the following:

Hypothesis (H4b) Company formalization positively moderates the relationship between startup cooperation capability and the coordination efficiency of startup cooperation initiatives of an established company.

4.3. Direct effects on new product innovativeness

Katila et al. (2008, p. 299) note that “overall, established firms are not very good at innovation,” making external knowledge search essential to improve innovativeness. The beneficial character of a company’s external knowledge search behavior has been subject to several studies (Katila and Ahuja, 2002; Grimpe and Sofka, 2009; Laursen and Salter, 2014), showing that external knowledge search activities positively affect a company’s innovativeness. In the context of startup cooperation, outreach success is the result of effective external knowledge search activities of an established company regarding startups and, as such, is positively associated with an established company’s innovativeness, resulting in more innovative new products. Thus, we hypothesize the following:

Hypothesis (H5) The outreach success of an established company has a positive effect on its new product innovativeness.

While efficiency is generally seen as a desirable goal for companies, it is not necessarily helpful for all situations. Especially in the context of innovation, too great a focus on efficiency can lead to a low level of explorative activities (Belderbos et al., 2010; Chen and Huang, 2010), as efficiency is usually associated with exploitative behavior. As startup cooperation can primarily be seen as an exploratory activity, we posit that the higher the degree of coordination efficiency of startup cooperation activities of an established company, the more likely it will fail to reach the objectives of startup cooperation regarding innovativeness. Therefore, we expect higher coordination efficiency to be associated with a lower degree of new product innovativeness, and propose the following:

Hypothesis (H6) The coordination efficiency of startup cooperation initiatives of an established company has a negative effect on its new product innovativeness.

5. Methodology

5.1. Sample

The study is based on a large-scale quantitative data sample obtained from surveying 195 managers and employees of German established companies that maintain startup cooperation initiatives. The criteria

Table 2. Sample characteristics

Industry sector	<i>N</i>	%
Biotech/pharma/chemical	20	10.3
Automotive	26	13.3
Software/IT/electronic	43	22.1
Machinery	28	14.4
Retail/consumer goods	16	8.2
Services	27	13.8
Other	35	17.9
Total	195	100.0
Firm age (years)	<i>N</i>	%
10–20	20	10.3
21–30	42	21.5
31–50	46	23.6
>50	87	44.6
Total	195	100.0
Respondents' company affiliation	<i>N</i>	%
1–5 years	70	35.9
6–10 years	49	25.1
11–15 years	30	15.4
16–25 years	25	12.8
>25 years	16	8.2
Not specified	5	2.6
Total	195	100.0
Employees (number)	<i>N</i>	%
50–100	20	10.3
101–500	55	28.2
501–1,000	30	15.4
1,001–5,000	34	17.4
>5,000	56	28.7

for firms to be considered “established” were the minimum age of 10 years and at least 50 employees. Most of the participants were innovation managers, product managers, or R&D managers with detailed knowledge of the startup cooperation activities and the innovation processes of their companies, which we assessed to ensure high-quality responses. Each of the participants represented a different established company. Furthermore, we implemented multiple attention checks. To find high-quality participants for our study, we used a service provider giving us access to an innovation panel and handling the survey distribution. We purposely did not focus on a specific industry, as startup cooperation is a relevant phenomenon across industry boundaries and our aim was to be able to generalize the results. The sample characteristics are shown in Table 2. We collected 303 completed questionnaires that fit the suitability

criteria, of which 195 met the quality requirements applied.

5.2. Measures

Along with the theoretical conceptualization, we adapted the scale for SCC based on Lambe et al.'s (2002) joint alliance competence to specifically fit startup cooperation in different settings. Following Lambe et al. (2002), we operationalized SCC as a second-order construct consisting of the three first-order constructs “startup cooperation experience,” “startup search and selection competence,” and “startup portfolio management competence,” which are each represented by three to four reflective items. The 11 total items used for these constructs are based on the corresponding items of the original scale.

After a targeted literature review on external knowledge sourcing (e.g., Monteiro and Birkinshaw, 2017) and startup cooperation (e.g., Weiblen and Chesbrough, 2015), we merged together fitting items and operationalized outreach success by developing a reflective scale with four items, which we further improved using experts' insights on startup cooperation. The construct comprises the most important facets of outreach success, specifically in the context of startup cooperation from an established company's perspective. These are the perceived ease of finding and contacting fitting startups, the number of promising partners that are interested in cooperation, and the application of high standards for partner selection. All of these facets are of special interest in the context of startup cooperation.

We measured coordination efficiency by adapting an existent scale (Patterson et al., 2005) to fit the context of startup cooperation from an established company's point of view. The scale targets an efficient use of resources, efficient planning processes, and the productivity level of startup cooperation pursued by an established company. Thus, we reduced the number of items from four to three due to suitability with the startup cooperation context. The variable new product innovativeness specifically measures the innovativeness of established companies' new products generated by startup cooperation. We modified an existent measure from Stock and Zacharias (2011) with five reflective items which target among other criteria the novelty and inventiveness of those products developed with the help of startup cooperation.

Our first moderating variable, resource availability, measures the availability of resources within an established company specifically for the purpose of startup cooperation. The scale is based on an existent measure (de Luca and Atuahene-Gima, 2007),

which we modified to fit the context of startup cooperation and included some elements of Pemartín et al.'s (2018) scale. For the second moderating variable, we adopted the scale company formalization from Patterson et al. (2005) to measure the degree of formalization of the focal established company. We integrated several well-established control variables in our model: Market-related dynamism (Homburg et al., 1999), technological turbulence (Jaworski and Kohli, 1993), competitive intensity (Jaworski and Kohli, 1993), industry, company's size and age.

We measured all the reflective items (see Appendix) using a 7-point Likert scale (1 = "strongly disagree" to 7 = "strongly agree"). Beforehand, five academic scholars assessed the survey, including all latent constructs, to ensure understandability and suitability of all items. Furthermore, all latent constructs were assessed regarding their reliability and validity. The values for Cronbach's alpha were ranging between 0.79 and 0.94, all above the commonly applied minimum of 0.70 (Bagozzi and Yi, 2012), which indicates high-scale reliabilities. The composite reliability of all constructs was very solid, with values between 0.80 and 0.94. The values of the average variances extracted (AVEs) were above the recommended minimum of 0.50 in most cases: only two constructs were below that value (0.49 and 0.47). However, we kept these constructs in the model because these values were very close to the recommended range and composite reliability was highly satisfactory (Fornell and Larcker, 1981). We applied the Fornell and Larcker (1981) criterion to test for discriminant validity, which showed satisfying results, as all square roots of the AVE values were greater than the respective correlations between the constructs. Table 3 presents the correlations of all constructs, as well as the square roots of the AVE values. The confirmatory factor analysis showed good results with all factor loadings of the items statistically significant at $p < 0.01$.

5.3. Model specification

To test our hypotheses, we analyzed the data applying covariance-based structural equation modeling (SEM) using Mplus Version 8.6. We chose a SEM approach as it is a powerful technique for multivariate analysis that allows estimation of latent variables, detects structures, and incorporates correlations of independent variables in the model. Even though SEM is said to produce more valid and meaningful results, the complex interpretation with the need for assumptions is often seen as a

drawback of the method. Altogether, the method is highly suitable for our complex analysis and helps us to examine the mechanisms of startup cooperation capability. To test the hypothesized main effects, we specified a basic model containing direct effects only, including the direct effects of moderators and control variables. The major global fit criteria corresponded to the common standards for structural equation modeling ($\chi^2/df = 1.52$; RMSEA = 0.051; SRMR = 0.066). We used two submodels to test the moderating effects: the first contained the moderating effects of resource availability ($\chi^2/df = 2.19$; RMSEA = 0.078; SRMR = 0.065), the second showed the moderating effects of company formalization ($\chi^2/df = 1.93$; RMSEA = 0.069; SRMR = 0.065). As a robustness check we tested whether the effects held within a full model containing all the direct and moderating effects ($\chi^2/df = 1.74$; RMSEA = 0.062; SRMR = 0.069), which was the case and suggests a stable solution.

We conducted several tests to assess potential common method bias. First, we applied Harman's single-factor test (Podsakoff et al., 2003), which resulted in three separate factors, none of which accounted for more than 39.7% of the covariance among the variables. Second, we tested for the effects of a common method factor (Podsakoff et al., 2003), on which all the basic latent constructs used in our model were allowed to load on. Comparing the results of the constrained and unconstrained model using a chi-square difference test, we found no indication that common method bias might be of concern in our data. Third, we applied a marker variable test following Lindell and Whitney (2001), the results of which suggest that common method bias is unlikely to be problematic. Overall, common method variance does not appear to severely impact our data and results.

6. Results

We present the results of our analyses in detail in Figure 3. The analyses show a positive relationship between SCC and outreach success ($\beta = 0.61$, $p < 0.01$), providing strong support for H1. Furthermore, the data indicate a negative effect of SCC on coordination efficiency ($\beta = -0.39$, $p < 0.05$), in support of H2. Thus, the empirically observed main effects of the novel dynamic capability SCC correspond to our theoretical considerations.

The analyses show mixed results regarding the first pair of hypothesized moderating effects. The interaction plots of the moderating effects are shown

Table 3. Correlation matrix and descriptive statistics of measures

Variables	1	2	3	4	5	6	7	8	9	10	11
1. SCC	[0.76]										
2. Outreach success	0.67**	[0.77]									
3. Coordination efficiency	-0.11	-0.15*	[0.77]								
4. Resource availability	0.74**	0.63**	0.01	[0.79]							
5. Company formalization	-0.21**	-0.15*	0.24**	-0.13	[0.87]						
6. New product innovativeness	0.62**	0.54**	-0.09	0.56**	-0.15*	[0.77]					
7. Market-related dynamism	0.47**	0.50**	-0.16*	0.37**	-0.29**	0.48**	[0.81]				
8. Technological turbulence	0.46**	0.37**	-0.22**	0.40**	-0.22**	0.41**	0.52**	[0.73]			
9. Competitive intensity	0.36**	0.31**	-0.14*	0.25**	-0.19**	0.28**	0.52**	0.35**	[0.69]		
10. Company size	0.06	0.01	0.03	-0.03	0.08	-0.04	-0.03	-0.02	0.03	-	
11. Company age	0.03	0.06	0.03	0.04	0.05	0.08	0.13	0.06	-0.02	-0.12	-
<i>Statistics</i>											
Mean	5.03	5.11	3.25	5.16	4.77	5.26	4.88	5.20	4.85	-	-
SD	1.13	0.95	1.31	1.19	1.70	1.04	1.26	1.14	1.15	-	-

Note: $N = 195$. Diagonal elements in square brackets are the square roots of the average variance extracted for reflective constructs with multiple items.

SCC, Startup Cooperation Capability.

* $p < 0.05$.

** $p < 0.01$.

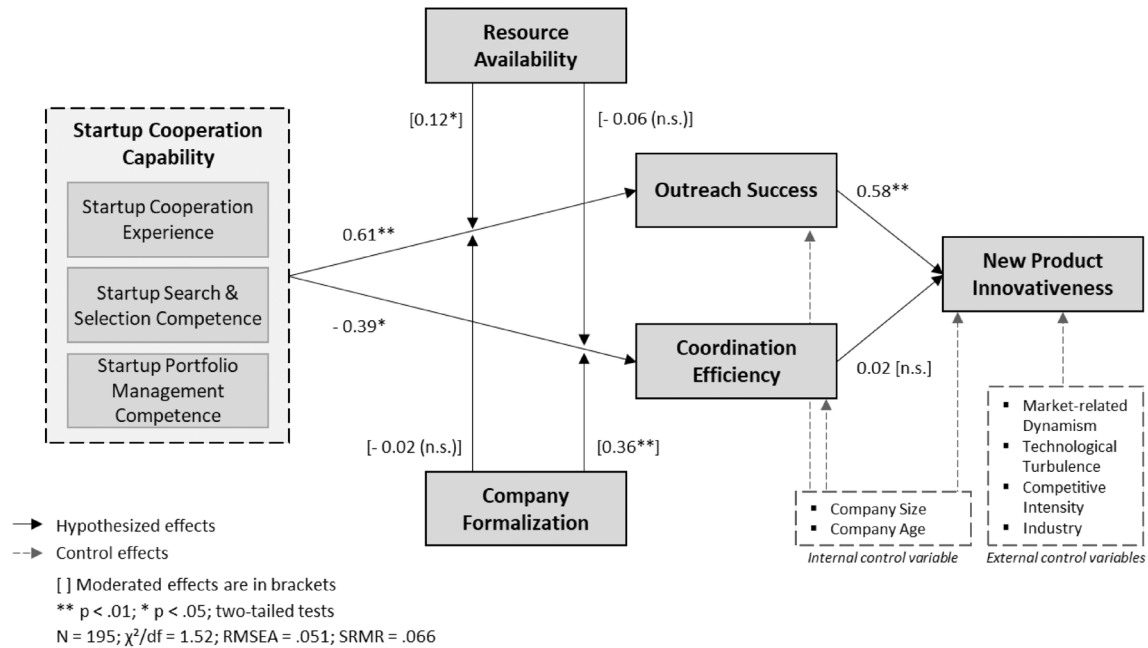


Figure 3. Results of SEM analysis.

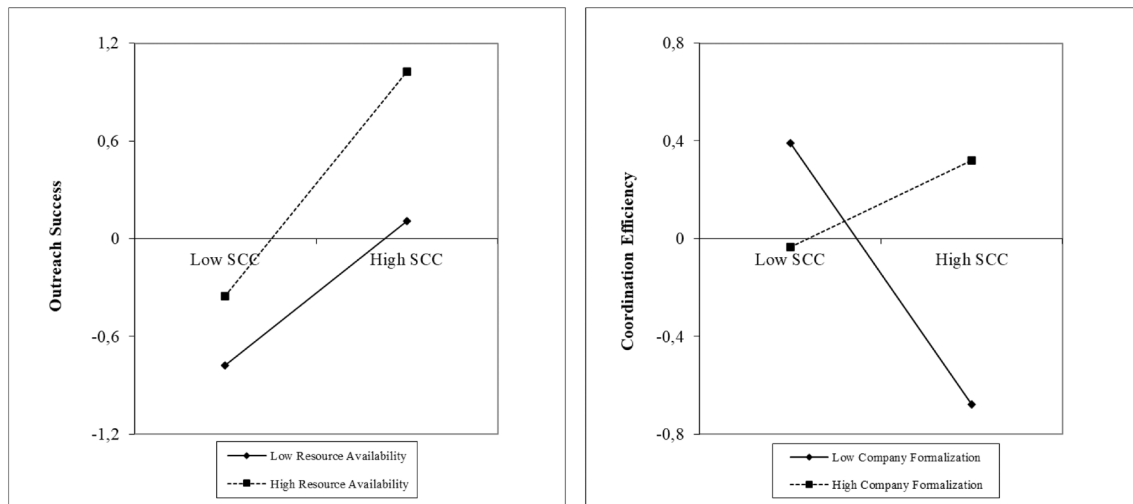


Figure 4. Interaction plots.

in Figure 4. While we found resource availability to positively moderate the relationship between SCC and outreach success ($\beta=0.12$, $p<0.05$), the moderating effect of resource availability on the relationship between SCC and coordination efficiency, although negative as predicted, is not statistically significant ($\beta=-0.06$, $p=0.46$). Thus, the data provide support for H3a but no support for H3b. This might be the case from a content perspective because a higher level of available resources may not only promote the realization of exploratory activities but also provide improved conditions for managerial activities targeting coordination efficiency.

Similarly, we observed mixed results for the second pair of moderation hypotheses. The hypothesized negative moderation of the relationship between SCC and outreach success by company formalization in H4a is not supported by the data analyzed ($\beta=-0.02$, $p=0.81$). It appears that company formalization does not necessarily hinder an established company in implementing effective outreach activities and successfully attracting startups, even though these startups might be more accustomed to informal structures. However, the results indicate that company formalization positively moderates the relationship between SCC and

coordination efficiency ($\beta=0.36$, $p<0.01$), in support of H4b.

While we found strong support for the positive effect of outreach success on new product innovativeness hypothesized in H5 ($\beta=0.58$, $p<0.01$), we observed no support of H6, which proposes a negative effect of coordination efficiency on new product innovativeness ($\beta=0.02$, $p=0.80$). This may be in line with the controversial role of efficiency in the context of innovation. While we argue that efficiency is associated more with exploitative activities than with explorative – and thus, innovation-stimulating – behavior, an opposing perspective might be that adequate coordination efforts are necessary to successfully interact with often less efficiently organized startups.

7. Discussion

7.1. Research implications

As outlined in the literature review section, many studies span the dynamic capabilities and inter-organizational cooperation research streams (for an overview see, e.g., Forkmann et al., 2018), however, there exists little research on the specific dynamic capabilities necessary for established companies to cooperate with startups successfully. Taking the major discrepancies between traditional cooperation approaches and startup cooperation into account, we conceptualize SCC by carefully considering the precise characteristics and requirements of this highly specific type of cooperation.

Thereby, we add to the fast-growing research stream of startup cooperation. Initial studies of startup cooperation research bridging the field with dynamic capabilities investigate either dynamic capabilities as outcomes of startup cooperation (Enkel and Sagmeister, 2020; Steiber and Alänge, 2021) or focus on a very specific subarea of startup cooperation, for example, buyer–supplier relationships between startups and established companies (Zaremba et al., 2017). Taking a broader perspective, SCC incorporates the whole spectrum of startup cooperation modes, thereby ensuring general applicability without limiting the findings to specific scenarios. The theoretical conceptualization as well as the developed latent scale to measure SCC can serve as valuable base for subsequent studies in this field.

Next to conceptualizing a dynamic capability for a specific context, it is of high importance how this capability is “working” and which effects it has. Previous literature on alliance capabilities in

traditional cooperation highlights the importance of these working mechanisms and examines the influence of alliance capabilities on relevant variables (e.g., Helfat et al., 2007; Schilke and Goerzen, 2010). Thus, in addition to conceptualizing startup cooperation capability, this study examines the mechanisms of SCC to create a deeper understanding of the effects and impact of this capability. With this examination, the study offers in-depth insights on how SCC is working instead of solely suggesting a new theoretical concept.

In this vein, we provide empirical support for a significantly positive effect of SCC on outreach success, which in turn positively affects the outcome of new product innovativeness. Thus, we provide evidence for the positive impact of SCC on a company's innovation outcomes and thereby transfer results of earlier studies on traditional cooperation (e.g., Ritter et al., 2002; Ritter and Gemünden, 2004) to the context of startup cooperation. At the same time, the data suggest that SCC negatively impacts the coordination efficiency of startup cooperation initiatives. This result is in line with traditional cooperation research postulating the coordination of alliances as major challenge (e.g., Reuer et al., 2002; Oxley and Sampson, 2004). Although we found no empirical support for a negative effect of coordination efficiency on new product innovativeness, the study's results nevertheless highlight the advantages and disadvantages involved with this capability, adding to a comprehensive knowledge base.

Finally, by including resource availability and company formalization as relevant contingency factors, we present an even more nuanced picture of SCC and its mechanisms. Previous literature emphasizes the high importance of resource availability in cooperation endeavors (e.g., Faems et al., 2010), which is crucial for the development of innovative products or services with cooperation partners (Herold et al., 2006). Equally relevant for startup cooperation is the factor of company formalization, as differences in the company cultures between startups and established companies are known to be potential hurdles (Weiblen and Chesbrough, 2015; Hogenhuis et al., 2017). In this study, we measured a general company formalization as this gives a good idea of how formalized startup cooperation activities of a company might be. However, there might be companies with different degrees of their formalization in their internal processes and their interactions with external startup partners, which might have an influence next to the effects we measured.

Because both resource availability and company formalization are known to be critical factors in startup cooperation, the knowledge of these

contingency effects helps set this new capability in context to previous and future research. Specifically, the study results show that a higher degree of resource availability can strengthen the positive relationship between SCC and outreach success and, thus, even intensify its positive impact on new product innovativeness. Interestingly, we did not find any empirical evidence for company formalization weakening the positive effect of SCC on outreach success, which may be explained by the higher “hit rate” in reaching out to promising startups based on a certain degree of a formalized course of action that, in turn, compensates for the negative effects associated with a high degree of formalization. Furthermore, we provide support for company formalization weakening the negative relationship between SCC and coordination efficiency.

7.2. Managerial implications

This study offers highly important insights for practitioners, especially for managers in established companies responsible for startup cooperation. With the knowledge of SCC, startup cooperation managers can investigate their company’s capabilities in this area and, if necessary, improve them. Our research offers an in-depth understanding for managers of the three facets that build SCC and thus, allows managers to assess their own company’s abilities and progress for each facet. Further, the conceptualization of SCC shows how startup cooperation differs significantly from traditional cooperation, stressing the highly specific requirements of startup cooperation. This differentiation offers valuable insights, especially for managers of established companies who are familiar with traditional cooperation but new to working with startups.

The examined mechanisms of SCC show which positive and negative effects startup cooperation managers can expect of SCC. First, our study highlights the importance of reaching out to potential startup partners and thus, aims at raising awareness for this facet of startup cooperation activities in corporate practice. This is particularly relevant, as managers might often not be aware of the very specific characteristics of the pre-cooperation phase in startup cooperation: While for traditional cooperation, potential partners are often known “players” in the market, this is not true for most cases in startup cooperation. Thus, managers need to engage actively in identifying potentially interesting new startups and reach out to them. Second, the results reveal the negative impact of SCC on coordination efficiency, providing insights on the disadvantages of this capability. With an awareness on this effect, startup

cooperation managers can prepare for this case and if applicable, initiate counteractions. This can prevent unrealistic expectations of managers “following the trend” of startup cooperation, who anticipate that implementing startup cooperation processes always easily results in positive outcomes.

Particularly interesting for established companies are the contingency factors we uncover. For example, our finding that a sufficient availability of resources for startup cooperation can even intensify the positive effect of SCC on outreach success, and consequently on new product innovativeness, is highly relevant for practice. Managers need to be aware that investing resources in startup cooperation is crucial to benefit from it. Simply setting up, for example, a lean accelerator program with little resource endowment and expecting immediate high returns is highly unrealistic. Established companies with a high degree of company formalization should be alert because formalization is generally known to be conflicting with the great flexibility of startup partners and thus, can create hurdles in the interaction. However, a higher degree of formalization can weaken the negative effect of SCC on coordination efficiency. Thus, managers of established companies can try to actively counteract the negative effects of SCC by implementing certain formalized management tools such as checklists or manuals specifically tailored to the demands of startup cooperation. With these measures, the efficiency levels regarding implemented startup cooperation might be stable even with a high level of SCC. Yet, managers of established companies need to keep in mind that too high levels of formalization tend to lead to challenges in the interaction with startups, which is why a well-considered punctual implementation of formalized tools might be helpful.

Summing up the central implications from this study, established companies’ SCC improve the innovation outcomes of startup cooperation, specifically for new product innovativeness. Looking at the dimensions of SCC, it is highly important for companies to be able to find and select the right startup partners, to learn from experiences with startups, and to manage the portfolio of startup partners adequately. For managers it is of high importance to ensure appropriate resource availability and to consider the degree of formalization in their company and their startup cooperation activities to avoid too formalized processes in startup interactions.

7.3. Limitations and further research

Although this study offers several important contributions, we acknowledge certain limitations that offer prospects for further research. First, we examined

SCC for startup cooperation in general, including a multitude of different cooperation modes, with the aim of establishing universal validity for this new dynamic capability. Although doing so provides a great advantage for further research, it also lowers the degree of explanatory power for very specific modes of startup cooperation.

Another limitation of the present study is that we conceptualize and examine SCC in terms of its mechanisms; however, we have not addressed how established companies can achieve or improve their SCC. While practitioners can use the valuable insights from our study to evaluate their own SCC and consequently assess whether improvement is necessary, further research on how specifically to achieve or improve SCC would be useful for established companies.

Furthermore, insights on contingency factors regarding SCC are of great interest for both researchers and practitioners. We focus on the moderating effects of resource availability and company formalization, as these factors are known to be highly relevant in the context of startup cooperation. However, many more potentially interesting contingency factors have yet to be examined, for example in the area of interpersonal competence and communication. For example, an investigation of the qualifications of employees in charge of startup cooperation or the frequency of communication with startup partners might lead to further valuable insights.

While our study is focused on the established companies' perspective on startup cooperation, a worthwhile idea for future research might be to include the startup perspective in analyzing the impact of startup cooperation capability. For example, new startups might approach established companies proactively, influencing the first facet of startup cooperation capability immensely. Furthermore, startups might be more or less experienced in cooperating with established companies and might adapt to established companies' processes, which impacts the other two dimensions of startup cooperation capability.

Data availability statement

The authors prefer to make no use of the data sharing option of *R&D Management*.

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Note

¹Another highly specific type of cooperation is corporate-university cooperation, which also has distinct frame conditions and requirements. However, it differs vastly from startup cooperation, for example, universities perform basic research and are usually not interested in developing and marketing new products.

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APPENDIX

Scale Items and Reliability Analysis

Constructs, Items, and Sources	α	CR	AVE
Startup Cooperation Capability (based on Lambe et al., 2002), containing three first-order constructs:	0.94	0.94	0.58
Startup Cooperation Experience	0.89	0.90	0.69
Your company...			
... has a deep base of experience with startup cooperation.			
... has engaged in many cooperation initiatives with startups in the past.			
... has used a great variety of different startup cooperation forms.			
... has much experience with maintaining and managing a startup cooperation portfolio.			
Startup Search and Selection Competence	0.86	0.86	0.61
Your company...			
... actively searches for promising startup partners.			
... is constantly seeking startup partnering opportunities.			
... has much experience with presenting itself as attractive partner for startups.			
... has a deep base of experience with the selection of fitting startup partners.			
Startup Portfolio Management Competence	0.88	0.88	0.72
Your company...			
... has programs to develop capable managers for startup cooperation.			
... understands how to produce effective startup cooperation managers.			
... has capabilities to efficiently manage its startup portfolio.			
Outreach Success (self-developed)	0.79	0.80	0.49
It is easy for your company to find fitting startups as potential cooperation partners.			
Your company...			
... successfully gets in touch with a substantial number of promising startups who are interested in becoming your partners.			
... usually applies high standards for startup selection as there are many promising and fitting startups.			
... is generally successful with the initiatives implemented to contact and find fitting startups.			
Coordination Efficiency (adapted from Patterson et al., 2005)	0.81	0.81	0.60
Time and money could be saved if startup cooperation were better organized in your company. (R)			
Poor scheduling and planning often result in targets of startup cooperation not being met. (R)			
Productivity could be improved if startup cooperation was organized and planned better. (R)			
Resource Availability (based on Luca & Atuahene-Gima, 2007; Faems et al., 2010; Pemartín et al., 2018)	0.88	0.87	0.63
Your company...			
... invests enough time and effort in its relationships to startup partners.			
... allocates the resources needed for startup cooperation.			
... has a sufficient number of personnel resources that can be allocated for the management of startup cooperation.			
... has uncommitted financial resources that can be used to fund startup initiatives at short notice.			
Company Formalization (adapted from Patterson et al., 2005)	0.94	0.94	0.75
In your company...			
... it is not considered extremely important to follow the rules. (R)			
... not everything has to be done by the book. (R)			
... employees can ignore formal procedures and rules if it helps get the job done. (R)			
... it is not necessary to follow procedures to the letter. (R)			
... nobody gets too upset if employees break the rules. (R)			

(Continues)

APPENDIX (Continued)

Constructs, Items, and Sources	α	CR	AVE
New Product Innovativeness (adapted from Stock & Zacharias, 2011)	0.87	0.88	0.60
New products of your company developed through / with help of startup cooperation ...			
... are novel.			
... are inventive.			
... differ significantly in terms of their newness from existing products / services of competitors.			
... are exceptional.			
... are not predictable.			
Market-related dynamism (adapted from Homburg et al., 1999)	0.91	0.91	0.66
In your market, major changes occur frequently in the area of ...			
... products offered by our competitors.			
... market development strategies of our competitors.			
... customer preferences in product features.			
... customer preferences in product quality/price relationship.			
... new competitors.			
Technological turbulence (adapted from Jaworski & Kohli, 1993)	0.81	0.82	0.54
The technology in your industry is changing rapidly.			
Technological changes provide big opportunities in your industry.			
It is very difficult to forecast where the technology in your industry will be in the next 2 to 3 years.			
A large number of new product ideas have been made possible through technological breakthroughs in your industry.			
Competitive intensity (adapted from Jaworski & Kohli, 1993)	0.82	0.82	0.47
Competition in your industry is cutthroat.			
There are many “promotion wars” in your industry.			
Anything that one competitor can offer, others can match readily.			
Price competition is a hallmark of your industry.			
One hears of a new competitive move almost every day.			
Industry	—	—	—
Which industry is your company operating in?			
Biotech /Pharma/Chemical; Automotive; Software/IT/Electronic; Machinery;			
Retail/Consumer Goods; Services; Other			
Company size	—	—	—
How many people are employed at your company?			
0–9 ^a ; 10–49 ^a ; 50–100; 101–500; 501–1.000; 1.001–5.000; >5.000			
Company age	—	—	—
Your company exists since ...			
0–9 years ^a ; 10–20 years; 21–30 years; 31–50 years; over 50 years			

Abbreviations: AVE, average variance extracted; CR, composite reliability; R, Reversed item; α , Cronbach's alpha.

^a We did not include companies with fewer than 50 employees or younger than 10 years in the study because they did not fit the criteria we applied for established companies.