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REVIEW PAPER

Absorptive capacity in family firms: a systematic literature review

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Abstract
Two-thirds of all businesses worldwide are family firms. For these family firms, absorptive capacity (AC) is key to acquiring, assimilating, transforming, and exploiting new, external knowledge for purposes of value creation. In this study, we conduct a literature review to obtain an overview of the existing research on AC in family firms. Drawing on 27 articles, we show that because of the family members' induced influence on the family firm, the findings from previous studies based on non-family businesses cannot be applied to family businesses. In fact, we demonstrate that this influence can even create ambiguous effects on the integration of AC into the firm. The results of our literature review indicate that on the one hand, family members promote the integration of external knowledge, that is, they utilize their family-specific resources. On the other hand, tapping on such family-specific resources can simultaneously cause family firms to isolate themselves and restrict the firm's access to external knowledge. Our analysis also reveals that research on AC in family firms is mostly conducted on a conceptual level and that the few empirical studies usually draw on simple, one-dimensional constructs. Thus, we encourage more future empirical research to draw on the multidimensional constructs of AC and family influence.

Keywords Systematic literature review · Family business · Absorptive capacity · Heterogeneity

JEL Classification M1 business administration · L2 firm objectives organization and behavior · D8 information knowledge uncertainty

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1 Introduction

The assimilation and processing of knowledge and information are at the core of a company's competitiveness (Chen et al. 2009; Hassani and Mosconi 2021). Globalization, intensifying competition (Wu et al. 2020), evolving environmental conditions, rapid technological development (i.e., Industry 4.0), and ongoing change in consumer preferences (Cruz-Ros et al. 2021; Mahmood and Mubarik 2020) underpin the need for companies to adapt to ultimately survive in the marketplace (Teece et al. 1997; Zahra and George 2002). Absorptive capacity (AC) refers to "the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal 1990, p. 128). In the research literature, AC is consequently viewed as a precondition for a firm's survival (Ávila 2022; Cohen and Levinthal 1989, 1990; Zahra and George 2002), especially in dynamic markets (David and Foray 2003; Peng and Lin 2021; Teece et al. 1997).

Since the publication of the pioneering article of Cohen and Levinthal (1990), the concept of AC has dominated organizational studies on organizational adaption (Lane et al. 2001; Marabelli and Newell 2014), competitive advantage (Ávila 2022), responsible management (Dzhengiz 2020), technological innovation, information technology (Roberts et al. 2012), and consequently, business performance and survival (Cohen and Levinthal 1989; Volberda et al. 2010; Lane et al. 2006; Zou et al. 2018). Specifically, by engaging with their stakeholders, companies become capable of rapidly discovering and integrating new trends and market changes (Chaudhary and Batra 2018; Chen et al. 2009; Nagati and Rebolledo 2012; Pütz et al. 2022). Through cooperation alliances, companies can learn new knowledge (Fredrich et al. 2019). Thus, companies can quickly develop new products and services based on relevant information (Cepeda-Corrion et al. 2022; Feser 2022; Lane et al. 2006; Medase and Barasa 2019). To achieve this internal knowledge transfer, companies require absorptive capacity and effective communication between employees (Szulanski 1996). In this manner, knowledge can be utilized and exchange and mutual learning can transpire between departments to develop new products (Tsai 2001).

Family firms are the most important types of business worldwide (De Massis et al. 2018a; Porta et al. 1999). Hence, the implications of the AC literature should be particularly important in family business research. Family firms are characterized by the unity of ownership and management (Chua et al. 1999). Accordingly, the family's influence in management decisions and the inclusion of family goals differentiate the actions and outcomes of family firms compared to non-family firms. These features also constitute family firm heterogeneity (Berrone et al. 2012; Chrisman et al. 2012; Daspit et al. 2021), which is based on the specific characteristics of the company regarding its values, attitudes, and intentions of the family (Chrisman et al. 2012), family vision and involvement (Chua et al. 2012), and actions and resources shaped by the family members to achieve family-centered goals (Daspit et al. 2021; Habbershon and Williams 1999; Gómez-Mejía et al. 2007).

In this context, differences in family business outcomes can arise from short-versus long-term management perspectives or through the pursuit of economic as well as non-economic goals (Daspit et al. 2021; Rubio-Andrés et al. 2022), which can depend on the influence of the family and the available resources (Chua et al. 2012). Families focus on the preservation of their socioemotional wealth, such as their reputation, which can relegate the financial goals of the firm to the background (Gómez-Mejía et al. 2007). Moreover, family firm heterogeneity – or "familiness" – is reflected in the unique resource base created by the involvement of family members in their business. Accordingly, family-specific resources are formed through experiences, skills, and the history and culture of the business. These attributes vary from one family business to another and cannot be easily imitated, thus resulting in competitive market advantages (Daspit et al. 2021; Habbershon and Williams 1999). Regarding familiness, the family also exerts a strong influence by deciding how resources and tacit knowledge should be passed on and used.

In line with these arguments, we propose that the existing knowledge base of a family firm with its family members is a prerequisite for the development and integration of AC into the firm (Cohen and Levinthal 1990; Frank et al. 2017; Daspit et al. 2019; Kotlar et al. 2020). Several existing literature reviews on AC indicate the extensive research that has been conducted on this topic (Duchek 2013; Dzhengiz 2020; Roberts et al. 2012; Zahra and George 2002). However, family business research has only recently begun to recognize AC as a research object; to date, no systematic literature review has analyzed AC in family firms.

To fill this gap in the research literature, we present a systematic literature review based on 27 articles. Our work generally addresses the following research question: *To what extent do the characteristics of family firms influence absorptive capacity outcomes?*

Our analysis is based on the assumption that the influence of the family strongly shapes the strategic decisions in a family firm. In addition, we propose that the family's influence can also trigger inefficient actions in relation to the business (Berrone et al. 2012; De Massis et al. 2018a; Gómez-Mejía et al. 2007). Therefore, specific family influences can produce divergent and ambivalent outcomes regarding AC (Andersén 2015; Daspit et al. 2019). Given the relevance of AC to competitiveness in a knowledge-based economy (Lane et al. 2006; Volberda et al. 2010) to generate innovations for increased profitability (Chen et al. 2009; Cruz-Ros et al. 2021) and customer knowledge for improved performance (Nagati and Rebolledo 2012), we posit that ignoring these family firm characteristics could incur a disadvantage for the family firm.

Our study contributes to family business research by providing the first systematic literature review in this growing field. We employed the involvement, behavioral, and identity approaches to analyze 27 articles. We found that research to date has largely covered (1) environmental influences, social capital, and entrepreneurial orientation regarding AC; and (2) how AC can be fostered in a family business to increase performance and innovation. Some articles focus on the specific influences of the family; overall, however, this area has not been extensively researched to date.

Interestingly, our results also revealed the ambivalent effects of the influence of the family on the business with regard to implementing AC. Specifically, we found that family firm heterogeneity can generate divergent outcomes in the specific dimensions of potential AC (consisting of acquisition and assimilation capabilities) and realized AC (comprising transformation and exploitation capabilities). In particular, our analysis indicated a negative effect on potential AC when familiness is strongly pronounced. This situation results from the family business insulating itself against the external world because of the fear of losing power. By contrast, for realized AC, a high degree of familiness showed a positive effect regarding AC. This result is based on family-specific social integration mechanisms and the efficient use of knowledge, that is, processes that are in turn related to the strong social capital of the family (Andersén 2015; Belkhodja and Daghfous 2021; Daspit et al. 2019; Pütz et al. 2022). Thus, we conclude that the manifestation of specific familiness dimensions will show opposite effects on potential AC versus realized AC. This mixed finding suggests the complexity of the ambivalence between potential AC and realized AC and the family influence.

Given the ambivalent influences of the family on AC, we propose that future research should examine the specific characteristics of the family more closely. We recommend the adoption of a behavioral approach to analyze features such as socioemotional wealth (SEW) and familiness in the context of AC. Such work would enable researchers to interpret family firm outcomes and heterogeneity and any ambivalence in the findings. In such research, distinguishing between the various dimensions and their characteristics is crucial because of their differing impacts on AC. For example, the family's long- and short-term orientations will affect these dimensions and AC, as such orientation is linked to the formation of stakeholder relationships and the building and sharing of knowledge (Chua et al. 2012). Additionally, future research should focus on the various internal (i.e., exercise, implementation, non-family members, internal tacit knowledge transfer) and external (i.e., access to external knowledge by stakeholders, reputation) family-specific factors that influence AC. Our findings are also important for managing family businesses. Negative influences on AC can threaten the existence of family firm in a dynamic and knowledge-based economy; hence, family member managers must strive to address these factors to mitigate their negative effects.

2 Theoretical framework

2.1 Absorptive capacity

Cohen and Levinthal (1989, 1990, 1994) introduced the term absorptive capacity (AC). AC is defined as "the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends" (Cohen and Levinthal 1990, p. 128). This ability is based on the existing knowledge that cumulatively develops. The knowledge base exists at the company and the employee levels (Brinkerink 2018; Cohen and Levinthal 1990, 1994; Eniola 2022). Therefore, the employees' ability to internally share their knowledge is crucial, as it enables other employees to acquire the knowledge and, for example, facilitate the development of new innovations (Belkhodja 2022). Lack of internal AC, ambiguities, and communication difficulties can hinder the knowledge transfer between employees (Szulanski 1996). By contrast, functioning knowledge exchange between departments can foster mutual learning and new knowledge creation (Tsai 2001). Externally, the knowledge base can be enhanced through intermediaries from universities, government, and society as well as through coopetition alliances (Feser 2022; Fredrich et al. 2019). Social networks with strong internal cohesion and broad reach can also expand the knowledge transfer and thus the knowledge base (Reagans and McEvily 2003).

Zahra and George (2002) reconceptualized the AC construct and added the dimension of knowledge transformation. They defined AC as "a set of organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic capability" (Zahra and George 2002, p. 186). The AC process starts with the "acquisition" capability of a firm to identify and acquire relevant external knowledge. The "assimilation" capability includes processes and routines that are needed to analyze, interpret, and understand the new knowledge (p. 189). The next process step entails the "transformation" capability, which involves developing and refining routines to combine the new external knowledge with the existing knowledge. The "exploitation" capability is necessary to integrate the external knowledge into existing processes to generate commercial output (p. 190).

These processes are categorized into potential AC and realized AC. Potential AC consists of acquisition and assimilation capabilities, whereas realized AC comprises transformation and exploitation capabilities. Within potential AC, knowledge is identified and acquired as well as analyzed and interpreted. For knowledge to be integrated and utilized within the company, it must first be transformed as realized AC. A crucial step in this transformation is the development and refinement of routines to facilitate the combination with new knowledge. The transition from potential AC to realized AC is enhanced by social integration mechanisms that constitute networks or coordinators within the organization for knowledge sharing (Balle et al. 2020; Zahra and George 2002). Potential AC and realized AC can be exhibited in different degrees within a firm. For example, strong potential AC and weak realized AC indicate that knowledge is successfully acquired but is inefficiently used, resulting in little competitive advantage (Daspit et al. 2019; Zahra and George 2002).

AC is a specific manifestation of dynamic capabilities, namely "the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al. 1997, p. 516; Schilke et al. 2018). AC is particularly important for small and medium-sized enterprises (SMEs), as it can help them to develop survival strategies and successfully master the challenges of globalization. AC can be achieved via technologies such as AI (Åström et al. 2022). However, many SME family businesses are poorly positioned in the area of digitalization. They often simply react to changes and engage in little strategic planning due to limited resources, inadequate digital management skills, and traditionalism, which can endanger their dynamic capability (Bouncken and Schmitt 2022). Networking can help (family) SMEs to internationally expand their business, even though such firms often encounter resource restrictions that cause difficulty in an international orientation (Chatterjee et al. 2022). In addition, companies can use coopetition alliances to learn from their partners, allowing knowledge exchange, which in turn can increase absorptive capacity (Fredrich et al. 2019).

To establish fast and cost-effective contacts with stakeholders, SMEs can use information and communication technologies, in other words, the internet. A strong exchange with customers can promote sales (Naradda Gamage et al. 2020) and help with the rapid knowledge exchange with stakeholders from all over the world (Cepeda-Carrion et al. 2022). In summary, external knowledge exchange enables SMEs to compensate for their resource constraints (De Massis et al. 2018b; Klewitz et al. 2012). The subdivision of AC into potential and realized forms enables a detailed examination to explain why some companies have better dynamic capabilities than others and thus have a competitive advantage (Ahmed et al. 2019; Todorova and Durisin 2007; Zahra and George 2002).

2.2 Family influence

The analysis of why certain firms have strong dynamic capabilities and therefore generate a competitive advantage is particularly interesting in the case of family firms. Family firms are characterized by a high degree of heterogeneity resulting from family integration (Chua et al. 1999; Daspit et al. 2021; Handler 1989). A mere comparison between family and non-family businesses provides a too simplistic black-and-white view that is not useful for examining family businesses in an in-depth manner. This point includes the homogeneous analysis of family businesses, which does not capture differences between family businesses. Hence, the influence of the family and the resulting heterogeneity must be included in the exploration of family businesses (Daspit et al. 2021; Hernández-Linares et al. 2017; Neubaum et al. 2019; Rovelli et al. 2021).

The consideration of the influence of the family has gained substantial relevance in recent years, and this body of research is constantly being developed further. The initial "involvement approach" focused on ownership, management, and control, which was applied for the general differentiation of family and non-family businesses (Handler 1989). This perspective was extended by the behavioral approach, given the fact that the specific characteristics of a family business can be shaped and defined not only by ownership but also by the behavior of family members (Chrisman et al. 2005; Chua et al. 1999; Daspit et al. 2021).

Following the behavioral approach, the influence of the family on the business is measured in the recent literature by various multidimensional constructs. Examples include the F-PEC scale, which encompasses the family's influence on power, experience, and culture (Astrachan et al. 2002; Klein et al. 2005); the FIFS scale (Frank et al. 2017), which measures the familiness approach introduced by Habbershon and Williams (1999); and the FIBER scale (Berrone et al. 2012; Hauck et al. 2016), which captures the notion of SEW conceptually described by Gómez-Mejía et al. (2007, 2011). These approaches can be extended by the concept of organizational identity, known as the "identity approach," which examines the identification of family members and stakeholders with the company (Albert and Whetten 1985; Rovelli et al. 2021; Zellweger et al. 2010, 2013).

Due to their multidimensionality, the concepts of familiness and SEW are often used for analyzing the influence of family members and the associated heterogeneity of the family business (Berrone et al. 2012; Daspit et al. 2021; Frank et al. 2017; Prügl 2019). Familiness can be described as the unique bundle of resources of a family firm, which is created through the interaction of the family, the individual members, and the organization (Habbershon and Williams 1999, p. 11). Family members' interactions with non-family members in the firm and the sharing of tacit knowledge create new resources (Boyd and Hollensen 2012; Habbershon and Williams 1999; Pütz et al. 2022). These resources, in turn, can induce a sustainable competitive advantage across generations (Irava and Moores 2010).

Socioemotional wealth includes the "non-financial aspects of the firm that fulfill the affective needs of the family, such as identity, the ability to exert influence over the family, and the perpetuation of the family dynasty" (Gómez-Mejía et al. 2007, p. 106). Due to the unity of the family with the company and the resulting influence of the family, the firm's decisions and strategies are influenced not only by the goals and resources of the company but also by those of the family (Chrisman et al. 2012, 2013; Daspit et al. 2021; Zellweger et al. 2013), especially the preservation of their reputation (Deephouse and Jaskiewicz 2013). This intertwined scenario can result in economically irrational decisions within the family firm. For example, protecting SEW can cause financial losses (Bauweraerts et al. 2020; Gómez-Mejía et al. 2007; Martin and Gómez-Mejía 2016). However, as the family identifies so strongly with the company, a failure of the company would equate with a failure of the family, and efforts are undertaken to prevent such failure (Bauweraerts et al. 2020; Chrisman and Patel 2012; Gómez-Mejía et al. 2007). In a related vein, the size of the company also has a decisive influence. The family presumably exerts a strong influence in a small company and somewhat less influence in a large company (Danes and Brewton 2012). Moreover, the manifestations of these constructs dynamically develop, and they are influenced by external and internal factors such as disasters, crises, family conflicts, and the succession process (Berrone et al. 2012; Daspit et al. 2021; Frank et al. 2010). Therefore, researchers should consider both the overall constructs and the individual dimensions and dynamically investigate the heterogeneity of family businesses (Daspit et al. 2021; Irava and Moores 2010; Martínez-Romero and Rojo-Ramírez 2017).

3 Methodology

In this study, literature review was selected as the most suitable methodology for obtaining an overview of existing research on AC in family firms. According to Tranfield et al. (2003), systematic reviews are used for collecting important scientific contributions in a specific research area by systematically summarizing the main results. As a result, research gaps can be identified and research questions for future research work can be formulated (Kraus et al. 2022). The results presented in this study are the outcomes of three steps, namely planning the review, conducting the review, and evaluating the articles regarding their recommendations for future research (Fabrizio et al. 2021; Feser 2022; Kraus et al. 2020; Rojas-Córdova et al. 2022; Tipu 2021). The first phase involves determining the research area that a review should cover and the type of literature that should be reviewed. A process is then developed, in which the procedure for selecting the literature is recorded. In the second phase, the sources are reviewed.

Applying these steps, we initially performed a keyword search in the following six databases: EBSCO, SSCI (ISI Web of Science), JSTOR, Springer Link, Emerald, and Wiley online. For the search, we used a combination of two groups of keywords and merged them with an AND conjunction. The first keyword was absorptive capacity. The second group concentrated on the identification of family firm-based literature and included the following keywords: (family firm* OR family business* OR family enterprise* OR family sme* OR family-owned OR family control* OR family led OR family owned*). We searched by the OR method, meaning that only one keyword of the combinations has to be present. The OR operation consequently generates all combinations of "absorptive capacity" with all the combinations and synonyms of "family firm." The search was conducted without other synonyms and was limited to "absorptive capacity," such that we could analyze the current research in this specific research field. Other theories related to AC, such as dynamic capability and (open) innovation, were disregarded.

For the analysis, only articles in peer-reviewed journals published in English were used. These journals meet a scientific standard, with validated knowledge, and have a proven influence on the research field (Kraus et al. 2022; Kubíček and Machek 2019; Tipu 2021). For this reason, no other types of sources (i.e., books or conference papers) were included in the analysis. The search was conducted until the end of 2022. Relevant articles published only as online first until the date of the search (End of October 2022) were likewise included in the sample and marked with an asterisk (*). As a first screening process, the articles were reviewed by title and abstract. All the found articles between 1990 and the end of 2022 were then examined in more detail.

To ensure the scientific quality of the reviewed articles, we excluded all the articles that were not listed in the Academic Journal Guide 2021 of the Chartered Association of Business Schools or the ones that were not ranked with at least a C rating in VHB-JOURQUAL 3 (2015) of the German Academic Association for Business Research (Kraus et al. 2020). The articles were required to be directly related to AC and family firms. Articles that did not explicitly consider AC in their analysis were excluded. For instance, AC was often used as a theoretical concept but was not included in the analysis and results. By contrast, articles that first explained AC and the dimensions but then considered only one dimension or included it under a synonym in the analysis were included. In a similar fashion, articles that lacked a clear reference to family businesses were excluded, that is, if "family business" was not mentioned in the data description or their characteristics were not explicitly mentioned or discussed in the article. Articles that included family businesses as a control variable but lacked an analysis of the results related to AC were likewise excluded. Furthermore, three other reviews that also tackled absorptive capacity in the analysis due to the examination of knowledge management were omitted (De Massis et al. 2013; Ge and Campopiano 2021; Santos et al. 2021). After applying these exclusions, 26 articles remained for consideration. Finally, to reduce the chance of overlooking a relevant paper, we then screened the reference lists of the

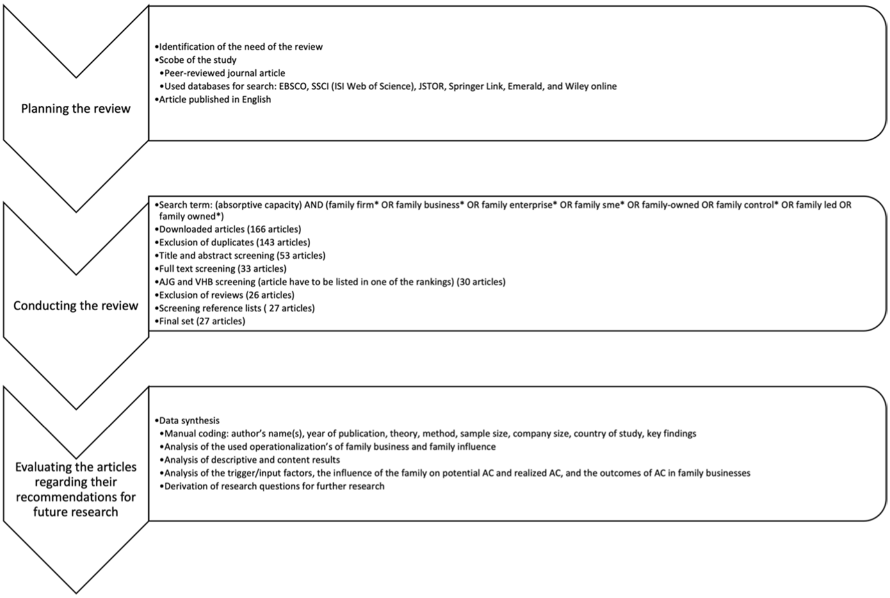


Fig. 1 Process of the systematic literature review

26 articles and found one additional relevant article. Our final sample of papers for analysis therefore included 27 articles.

To obtain an overview of the included studies, a manual coding of the final sample was performed (Kraus et al. 2022). This overview included the author's name(s) and year of publication, theory, method, sample size, company size, country of study, and key findings. The findings were then sorted in a table according to the antecedents of absorptive capacity in family firms (see Appendix Table 5), the family firm influence on absorptive capacity in family firms (see Appendix Table 6), and the outcomes of absorptive capacity in family firms (see Appendix Table 7). Additionally, the articles were classified according to which operationalization of family business and family influence was used. Finally, the third and last phase involves summarizing the results of the 27 articles and providing recommendations for future research (Fig. 1).

4 Descriptive analysis

An initial review of the articles showed that research related to AC and family firms is still young, but the topic has gained increasing research attention since 2010 (see Fig. 2). Between 2018 and 2022, 14 articles were published, which represent more than half of the 27 analyzed articles between 2010 and 2022. Given the increasingly knowledge-based economy and the growing relevance of knowledge management, the absence of a clear upward trend in publications despite continuous research is therefore surprising.

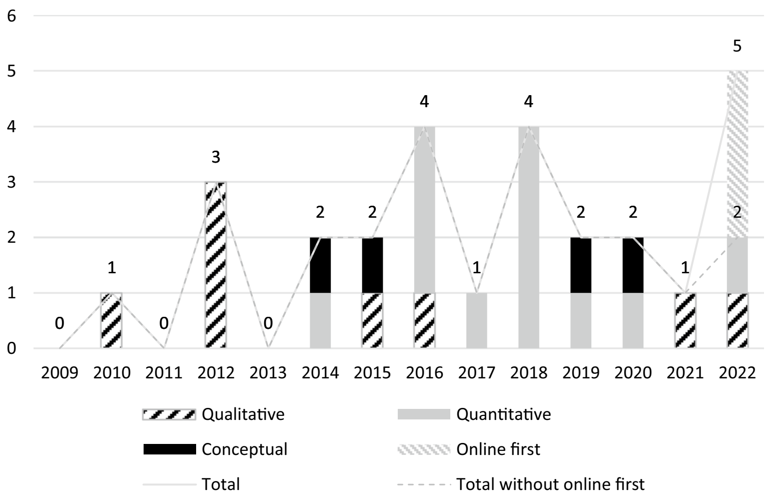


Fig. 2 Distribution of publications and methodology used in years

Additionally, no discernible trend in the number of published journals was detected. Four journals had published the largest number of articles, namely *Entrepreneurship Theory and Practice*, *Journal of Family Business Management*, *Journal of Family Business Strategy*, and *Sustainability* (7.4% of the articles, 2 of 27 papers). Of these journals, *Entrepreneurship Theory and Practice* is a highly renowned publication, and it once again points to the relevance of the topic. The other articles were published in 17 other journals. In general, the journals and their orientation indicate that the topic is more relevant in the field of management research than in the field of entrepreneurship (see Appendix Tables 5, 6, 7). To analyze the influence of the articles, we used the number of SSCI citations. We found that the article of Klewitz et al. (2012) was the most cited paper (108 citations). In their paper, the authors examined the influence of public intermediaries on weak AC. The 10 most cited articles are listed in Table 1.

The 27 reviewed articles were written by 55 authors, and on average two authors were involved per article. The most profiled author contributing to the publicized articles was De Massis with 125 articles. De Massis was also the most cited author with 5,916 citations in SSCI, representing 14.1% of all the authors' citations of the 27 analyzed articles. Furthermore, 26% of the articles had at least one author from a Spanish University (see Table 2).

A closer examination of the articles indicated that a quantitative approach was the predominant method used in AC and family firm research. This method was adopted by 14 articles (52%), representing more than half of the collected sample. These articles used mostly data from Spain (7 out of 27.26%). A qualitative approach was applied in nine articles (33%), of which seven articles were case studies. A conceptual approach was adopted in four articles (15%). More detailed information is provided in Fig. 2 and Appendix Tables 5, 6, and 7. Overall, in 18 articles (67%), the empirical work was geographically focused on the European

Table 1 Most cited articles

Article	Total citations in SSCI
Klewitz et al. (2012)	108
Chirico and Batra (2018)	100
Andersén (2015)	56
Daspit et al. (2019)	40
Kotlar et al. (2020)	38
Brinkerink (2018)	37
Sánchez-Sellero et al. (2014)	35
Chaudhary and Salvato (2016)	33
Muñoz-Bullón et al. (2020)	33
Hernandez-Perlines (2018)	31

region. The earliest study was conducted in 2010 with British data, and we found that no other British dataset had been analyzed to date. Spanish data were used most frequently, and they formed the basis for seven articles (26%), five of which were published between 2017 and 2022. The articles primarily focused on data from one country, and only one article used data from two different countries, both based in Europe (see Table 3).

Approximately one third of the studies adopted a theoretical approach (12 articles), although only three papers (Daspit et al. 2019; Hernández-Perlines 2018; Pütz et al. 2022) employed the same theory (i.e., dynamic capability theory). Seven articles employing a theoretical approach can be assigned to the behavioral approach (see Table 4). The theories were applied to explain the influence of the family on AC (Diéguez-Soto and Martínez-Romero 2019; Muñoz-Bullón et al. 2020; Pütz et al. 2022). The use of dynamic capability theory can be attributed to the connection of the two theories, as AC can lead to dynamic capability (Schilke et al. 2018; Zahra and George 2002). This dynamic capability promotes the ability of the family business to respond to changing environmental conditions and thus enhances its longevity (Eisenhardt and Martin 2000; Teece et al. 1997).

A co-citation analysis is shown in Fig. 3. Only authors with at least seven citations are included. Each circle represents an article. The circle size reflects the number of citations. The lines denote the articles that were cited together in the same article. Evidently, the basic research articles were often cited in both management and entrepreneurship research, namely Zahra and George (2002), Cohen and Levinthal (1990), Lane et al. (2006), and Todorova and Durisin (2007). Similarly, the articles on the left-hand side mostly quote one another, and little connection exists to the right-hand side – management research.

As shown in Fig. 4, only 14 articles of the dataset (27 articles) cite another article of the dataset. Of these articles, four are more heavily cited: Brinkerink (2018), Kotlar et al. (2020), Daspit et al. (2019), and Muñoz-Bullón et al. (2020).

The different conceptualizations and operationalizations of family business and family influence are presented in Table 4. As noted above, we expect the operationalization to have an impact on the analysis and subsequent findings related to AC.

Table 2 Authors sorted by number of articles

Author	Number of citations	Number of articles	Overall % citations	Author's affiliation
De Massis, A	5916	125	14.1	Italy
Frattini, F	4159	98	9.9	Italy
Hansen, EG	3185	42	7.6	Austria
Chirico, F	2871	110	6.8	Italy
Kotlar, J	2519	39	6.0	Italy
McAdam, R	2220	91	5.3	Northern Ireland
Pearson, AW	2053	29	4.9	USA
Salvato, C	1869	29	4.4	Italy
Kammerlander, N	1735	44	4.1	Swiss
Neirotti, P	1684	39	4.0	Italy

Table 3 Database country of origin

Database origin	Number of articles	Overall percent
Spain	7	25.9
Germany	3	11.1
UK	2	7.4
UEA	2	7.4
2 countries (Italy & Swiss)	1	3.7
Denmark	1	3.7
Dutch	1	3.7
Swiss	1	3.7
China	1	3.7
India	1	3.7
Nigeria	1	3.7
Italy	1	3.7
Polish	1	3.7
No Data	4	14.8
Total	27	100.0

Therefore, the operationalization of family business or family influence was divided into three categories: involvement approach, behavioral approach, and identity approach. We then examined the possible correlations between the methodological approach and the operationalization.

The identity approach was not found in any of the papers analyzed, whereas the involvement approach was adopted in most of the papers. All of the conceptual papers used the behavioral approach. Three papers employed the concept of familiness (Andersén 2015; Daspit et al. 2019; Pütz et al. 2022), and two considered the general influence of family members (Duh 2014; Rondi and Rovelli 2022).

Kotlar et al. (2020) criticize the "lack of theoretical consensus around existing 'umbrella' constructs capturing the family owners' influence on the business" (p. 4). Based on this argument, they present a theoretical framework focusing on two specific dimensions that are triggered by family ownership: emotional attachment of family owners with the firm and power concentration.

In the articles covering familiness, the inclusion of the concept of Andersén (2015) and Daspit et al. (2019) could be traced back to the definition by Pearson et al. (2008). Pearson et al. considered familiness from the social capital perspective, with three dimensions: structural, cognitive, and relational. Pütz et al. (2022) used the construct of Frank et al. (2017) for the analysis, who define familiness as decision premises that "have the potential to become resources and capabilities in the sense of the RBV [resource-based view] if they meet the VRIN [valuable, rare, inimitable, and non-substitutable] criteria" (Frank et al. 2017, p. 714).

In the next section, the contents of the articles are presented according to our analysis of the AC process. First, we elaborate the activation triggers and

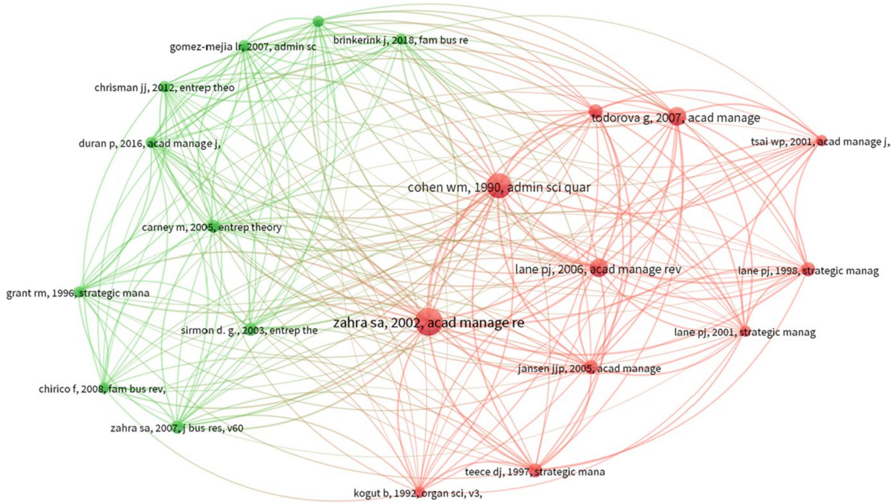
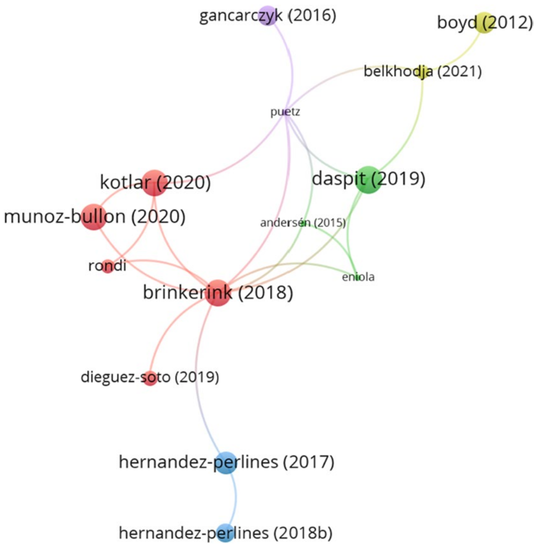


Fig.3 Co-citation analysis

Fig.4 Citation analysis between articles from the sample



input for the creation of AC; that is, we highlight the important events for the company that initiates the use of AC (trigger) and knowledge sources for the exercise of AC (input). We subsequently discuss family and firm influences on potential AC and realized AC. Finally, we present the outcomes of AC in family firms (Fig. 5).

Table 4 Used operationalization's of family business and family influence

Author (Year)	Theory	Method	Operationalization of family business/ influence	Approach
Andersén (2015)	–	Conceptual	Familiness (dimensions of social capital) (Pearson et al. 2008)	Behavior approach
Belkhodja (2022)	Knowledge based theory	Qualitative/Case study	Businesses with two generations of the same family and strategies are influenced by family members	Behavior approach
Belkhodja and Daghfous (2021)	Grounded theory	Qualitative/ Case study	Firms where one or more families have an effective controlling ownership interest/ familiness (Pearson et al. 2008)	Behavior approach
Boyd and Hollensen (2012)	–	Qualitative/Case study	Family-owned, based on the 50% control definition	Involvement approach
Brinkerink (2018)	–	Quantitative	Self-perception/ family owns more than 50% of the company`s shares	Involvement approach
Cepeda-Carrion et al. (2022)*	–	Quantitative	Focus on management commitment and on the transition of the company from one generation to the next. The strategic behavior is determined by idiosyncratic characteristics (e.g., family ownership, management, and participation) and motivations (e.g., transgenerational succession)	Behavior approach
Chaudhary and Batra (2018)	–	Quantitative	Family members (first- or second-generation) who was involved in the operations of the firm for a significant period as these people are most likely to be aware of the strategy of the firm	Involvement approach
Chirico and Salvato (2016)	–	Quantitative	Family-owned (majority of equity), multiple family members involved in their operations, recognition as a family business by the family CEO	Behavior approach

Table 4 (continued)

Author (Year)	Theory	Method	Operationalization of family business/ influence	Approach
Daspit et al. (2019)	Dynamic capability perspective	Conceptual	Involvement of the family: (dimensions of social capital) (Pearson et al. 2008)	Behavior approach
Diéguez-Soto and Martínez-Romero (2019)	SEW approach	Quantitative	Family Management/ number of family members involved in top management	Behavior approach
Duchek (2015)	–	Qualitative/ Case study	Family-owned businesses	Involvement approach
Duh (2014)	Knowledge creating theory	Conceptual	Involvement of the next generation of family members	Behavior approach
Eniola (2022)*	–	Quantitative	Family members own the majority of shares and do not distinguish between ownership and management	Behavior approach
Filippini et al. (2012)	–	Qualitative/ Case study	Top management in family hands	Involvement approach
Gancarczyk and Gancarczyk (2016)	–	Qualitative/ Case study	Family-owned firms	Involvement approach
Hernández-Perlines (2018)	Dynamic capability theory	Quantitative	Not specified Data from the "Spanish Institution for Family Business"	Involvement approach
Hernández-Perlines and Xu (2018)	–	Quantitative	Not specified Data from the "Spanish Institution for Family Business"	Involvement approach
Hernández-Perlines et al. (2017)	–	Quantitative	Not specified Data from the "Spanish Institution for Family Business"	Involvement approach
Klewitz et al. (2012)	–	Qualitative	Family owned	Involvement approach

Table 4 (continued)

Author (Year)	Theory	Method	Operationalization of family business/ influence	Approach
Kotlar et al. (2020)	–	Conceptual	Multiple dimensions of family ownership (emotional attachment/ power concentration)	Behavior approach
McAdam et al. (2010)	–	Qualitative/ Case study	Family-run	Involvement approach
Muñoz-Bullón et al. (2020)	Behavioral theory Resource-based view	Quantitative	Family involvement (members actively involved in management)	Behavior approach
Pütz et al. (2022)*	Dynamic capability theory Signaling theory	Quantitative	Familiness (multidimensional FIFS scale) (Frank et al. 2017)	Behavior approach
Rondi and Rovelli (2022)	–	Conceptual	Self-perception/ members of the same family control more than 50% of the shares	Behavior approach
Sánchez-Sellero et al. (2014)	–	Quantitative	Family active in control or management/ management affects behavior of the firm	Involvement approach
Wang (2016a)	Stewardship theory	Quantitative	More than 50% of the voting shares are controlled by one family, and/or a single family group effectively controls the business, and/or a significant proportion of the senior management is members from the same family	Involvement approach
Wang (2016b)	Social capital theory	Quantitative	family group participates actively in the control or management of the enterprise	Involvement approach

*Relevant articles published only as online first until the date of the search (End of October 2022)

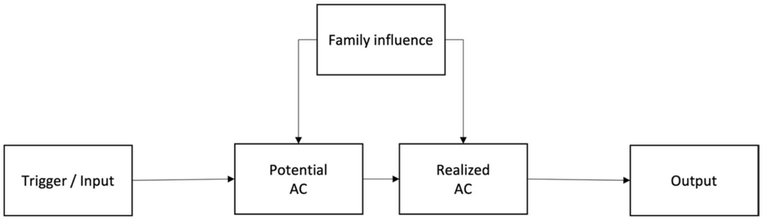


Fig. 5 Graphical illustration of the analysis of the AC process

5 Current research status

5.1 Trigger and input of potential and realized absorptive capacity

The drivers for learning new knowledge are referred to as activation triggers. These drivers can be corporate crises, a new corporate strategy, rapidly changing environmental conditions, technological change, or competitive pressure (Duchek 2013; Zahra and George 2002). Boyd and Hollensen (2012) categorized the drivers into situational triggers (e.g., environmental disasters) and structural triggers. Structural triggers include changes in the industry, such as the acquisition or consolidation of competitors (McAdam et al. 2010).

Learning new knowledge requires the integration and input of internal and external knowledge sources. Family businesses should remain receptive and constantly refresh their knowledge and adapt it to new trends and technologies in the market to prevent their knowledge base from stagnating and ensure that such knowledge base can be used profitably (Andersén 2015; Filippini et al. 2012; Wang 2016a). The presence of dynamic change indicates that no solutions for developments or routines can be long term, as such occurrence would cause mental rigidity and create obstacles in business development (Wang 2016a). Information for renewing the existing knowledge base can be obtained from suppliers, customers, employees, and intermediaries and their networks (Boyd and Hollensen 2012; Klewitz et al. 2012; McAdam et al. 2010). These sources are crucial for (small) family businesses with few available resources and a weak AC (Klewitz et al. 2012; McAdam et al. 2010). However, opening up to the outside world is important for family businesses to enable external knowledge transfer. According to Pütz et al. (2022), high familiness has a positive effect on AC, but only if the relationship is mediated by corporate social responsibility (CSR). Through CSR, the family business can signal familiness to its external stakeholders, thereby opening the company to the outside world. Stakeholders consequently trust the family business and express a willingness to share their knowledge (Pütz et al. 2022). Furthermore, entering into collaborations allows scarce resources to be conserved. Knowledge bottlenecks in a family business, and the associated poor AC performance, can be avoided through knowledge sharing, and new networks for exchange can be established (Filippini et al. 2012; Klewitz et al. 2012). Existing collaborations should be maintained. Family firms are skilled at delivering cohesive innovation services and leveraging established and familiar knowledge sources and linking them to existing knowledge (Brinkerink 2018). In addition, employees represent an important source of knowledge. In their case, the process of knowledge acquisition starts at the recruitment stage (Boyd and Hollensen 2012). Qualified employees can add specialized knowledge from various areas, years of market experience, and a strong network to the family business (Boyd and Hollensen 2012). Collaborations with universities can improve the recruitment of qualified employees who have graduate knowledge; such collaboration broadens the knowledge base and allows direct recruitment to transpire (McAdam et al. 2010).

Diversity of educational attainment among employees who are recruited increases the number of gatekeepers – who filter and transfer knowledge – available to scan the environment. Moreover, strong internal communication and collaboration can promote knowledge sharing (McAdam et al. 2010). In difficult situations and crises, such communication enables the possibility of drawing on the different skills and broad potential of employees, resulting in effective crisis management (Boyd and Hollensen 2012). Similarly, innovation facilitators can introduce new processes, routines, and procedures into the family business. This effort can strengthen various areas of the business and improve AC while increasing the capacity for innovation (Klewitz et al. 2012). However, employees should be constantly integrated into these processes, especially in the implementation of AC. Their work can introduce goal-oriented processes and maintain the freedom and flexibility required for AC (Duchek 2015).

Aside from the education of employees, the education of family members – especially the successor – has a strong impact on the foundation and practice of AC in the business. The level of education and professional training of the successor constitute the basis for the development of analytical skills and decision-making ability. They also serve as a basis for new ideas and the recognition of management and of economic trends. Finally, education influences the firm's performance after the transfer of the family business (Duh 2014).

The early socialization of the successor into the family business should occur during the succession process. A mentor from the management level can ensure the early transfer of values, behaviors, skills, and tacit knowledge. These transfers expand the knowledge base and promote assimilation during the succession process and its chance of success (Duh 2014). In addition, the expression of entrepreneurial orientation can affect the formation of AC by allowing new opportunities to be identified and evaluated. The resulting innovativeness, proactivity, and risk-taking within the firm can determine the ability to exercise AC, among other factors (Hernández-Perlines et al. 2017).

In summary, various triggers initiate AC. Several internal and external input factors have been identified that can promote, but can also hinder, the formation of AC.

5.2 Family and firm influences on potential and realized absorptive capacity

In addition to the above-mentioned determinants, various factors can influence the implementation of AC. The results of our analysis of the influence of family and firm on potential AC and realized AC revealed differences depending on whether the involvement approach or the behavioral approach was employed. The involvement approach showed simple influences, whereas the behavioral approach suggested strong complexities and ambivalences for potential AC and realized AC. In this section, the results related to the involvement approach are presented first, followed by the results for the behavioral approach.

5.2.1 Involvement approach

The involvement approach can be employed to highlight differences between family and non-family businesses. One such difference is that compared to non-family businesses, family businesses invest less in research and development (R&D), which nevertheless forms the basis of AC. However, family businesses often have the advantage of being able to transform the generated knowledge into innovations more efficiently than non-family businesses (Brinkerink 2018). By rejuvenating and combining new knowledge, family businesses can improve their products and production processes and achieve economies of scale (Brinkerink 2018). Furthermore, family businesses have the benefit of effectively integrating and combining internally developed knowledge. They can act creatively because of their strong employee ties, internal social capital, and relatively long time horizons (Brinkerink 2018; Wang 2016b). Internal social capital refers to social networks consisting of structural, cognitive, and relational capital (Wang 2016b). However, overall AC performance in exploratory R&D innovation is lower in family firms than in non-family firms. This outcome is related to the lower potential in family firms through SEW. For example, family firms hire less external management talent than do non-family firms. New technologies are less likely to be integrated into a family firm to avoid the loss of control (Brinkerink 2018). Nepotism and the mismanagement of resources can also negatively affect AC (Sánchez-Sellero et al. 2014). By contrast, family firms have an advantage in terms of exploitative innovation. They are confident about their long-standing (external) sources of knowledge, which are familial due to intensive exchange and can thus be effectively integrated (Brinkerink 2018). Diéguez-Soto and Martínez-Romero (2019) analyzed the effect of family management on intramural and extramural R&D. Their results showed a positive effect associated with having a higher number of family members in management; this scenario eliminates the concentration of power, reduces risk aversion, and emphasizes the long-term orientation of the family business.

In summary, family businesses tend to engage in less R&D than non-family businesses, but this disadvantage is outweighed by better knowledge integration. R&D in turn is influenced by the family's heterogeneity, such as the SEW or the number of family members in management.

5.2.2 Behavioral approach

The behavioral approach was analyzed in most of the studied papers using the familiness construct. Andersén (2015), Belkhodja and Daghfous (2021), and Daspit et al.

(2019) adopted the familiness approach of Pearson et al. (2008); in such approach, familiness is defined across the three dimensions of social capital, namely structural, cognitive, and relational. Kotlar et al. (2020) examined only the partial dimensions of familiness by assessing the influence of multiple dimensions of family ownership. The authors aimed to reconcile the contradictory theories of the “umbrella” constructs of familiness and SEW.

Our analysis of the articles revealed strong ambivalence that contradicts previous research. Family business research has repeatedly shown that family businesses have a special (external) social capital and unique tacit knowledge through which they achieve their competitive advantage (Frank et al. 2010; Pearson et al. 2008). Family businesses are also characterized by good relationships with their stakeholders, which are often maintained for many years (Bingham et al. 2011; De Massis et al. 2018b; Miller and Le Breton-Miller 2005). With familiness, a good relationship similarly exists between family members and employees, which results in the cultivation of a reliable permanent staff. A permanent exchange transpires in which knowledge is transferred (Frank et al. 2017). Furthermore, familiness creates an organizational identity and trust between the company and its stakeholders, which leads to collective action (Zellweger et al. 2010).

However, the preceding characteristics could not be consistently demonstrated in the context of familiness and AC. Andersén (2015) and Daspit et al. (2019) derived different effects for potential AC and realized AC. For the analysis, we initially considered potential AC and then realized AC. The authors reported a negative effect of familiness on potential AC, which was triggered by the drive to preserve power and avoid collaborations; low R&D performance and limited external orientation also emerged (Andersén 2015). This attitude engenders insularity, with family firms relying on their existing knowledge (Belkhodja and Daghfous 2021; Daspit et al. 2019). The concentration of family members in the business reinforces the insularity (Daspit et al. 2019). Family members share a common language and experience that result in connectedness and effective communication, which cannot be achieved by non-family members. Building trust with employees and developing a shared vision can reduce the insularity. With regard to external partners, family members perceive a high risk in misaligned goals and incongruent actions (Daspit et al. 2019). By contrast, Eniola (2022) concludes that family members can act as gatekeepers for knowledge transfer because of their networks. They function as high-level decision makers who monitor knowledge access, which is then subsequently hindered due to their family ties and affective-emotional issues.

Again, integrating non-family members can reduce the negative effects of family members on potential AC. Such integration creates a broad network with the family business, opens it to external knowledge resources, and supports change (Daspit et al. 2019). Hence, although familiness is considered a competitive advantage because of unique resources and knowledge, specific knowledge can have a negative effect on potential AC (Andersén 2015). The basis for knowledge assimilation between two actors is their congruence and similar interpretations of the relevant knowledge. Another essential factor is the willingness of the family business to renew itself, which runs counter to familiness and its stable orientation. Therefore, an increase in familiness brings a negative effect to potential AC (Andersén 2015). However, this disadvantage is relatively low for family companies that operate in a stable environment, as they have sufficient time to recognize and absorb knowledge (Andersén 2015).

On the contrary, for realized AC, familiness has a positive influence (Andersén 2015; Daspit et al. 2019). Family firms are characterized by a more efficient use of knowledge compared to non-family firms (Andersén 2015). Familiness also generates social integration mechanisms, reducing the gap between potential AC and realized AC (Andersén 2015; Boyd and Hollensen 2012). Strong social capital is an important factor in knowledge transformation and implementation (Andersén 2015) as it enables communication and knowledge sharing (Wang 2016b). Similarly, the characteristics of stability, established routines, and tacit knowledge have a positive influence (Andersén 2015). Overall, high familiness promotes the combination and use of new knowledge and reduces costs through effective implementation and long-term orientation (Andersén 2015).

The differences between family members and non-family members are apparent (Daspit et al. 2019). Family members can build a complex knowledge construct among themselves, through which they can effectively implement realized AC at a low cost, thereby generating innovative outcomes (Daspit et al. 2019). The integration of non-family members reduces this innovativeness because the efficiency of exchange is diminished due to incongruent goals and higher costs (Daspit et al. 2019). However, the family may also exert a negative influence if family conflicts and rivalries hinder the flow of knowledge (Andersén 2015; Eniola 2022). Older family members and employees likewise often impede the use of knowledge, as they distrust changes and demonstrate little confidence in the new knowledge (Eniola 2022).

Belkhodja and Daghfous (2021) reported that the selected approach to knowledge management affected familiness and, thus indirectly, AC. Familiness positively influenced potential AC when an explicit approach – observable or written knowledge – was chosen. For realized AC, a tacit approach – knowledge through experiences, values, and context – yielded a positive effect. Both approaches focus on either potential or realized AC, thereby either promoting the insularity of the family firm or neglecting the unique tacit knowledge. The results of Belkhodja and Daghfous (2021) are consistent with the ones of Andersén (2015) and Daspit et al. (2019).

In the strategic knowledge management approach, both potential AC and realized AC are regarded as the social capital of family and non-family members. This approach also considers both the current and future competitive advantages. Familiness is perceived as human and social capital – a view that promotes the diversification of knowledge sources (Belkhodja and Daghfous 2021). Strong social capital is generally regarded as a positive influencing factor on AC (Wang 2016b).

Taking social capital into consideration, Belkhodja (2022) distinguishes between the tacit and strategic knowledge management approach and AC. He finds that the tacit knowledge management approach hinders AC. Knowledge is held by family members and only in some cases passed on to employees in its entirety and otherwise in a restricted manner. Hence, the integration of new knowledge is hampered as the company's knowledge is unavailable to all employees. By contrast, the strategic knowledge management approach promotes AC. The knowledge of family members is openly communicated within the company and routines and processes are adapted. Company decisions are market-oriented, flexible, and aligned with market conditions. As a result, trends and customer needs can be rapidly identified and addressed, creating competitive advantages.

Kotlar et al. (2020) examined the influence on AC based on several dimensions of family ownership. These dimensions represent an aspect of familiness. Different influences resulted in distinctions between potential AC and realized AC. Emotional commitment had a negative impact on potential AC, whereas internal knowledge was valued more highly than external knowledge, with a relatively low willingness to acquire external knowledge. This scenario was reinforced by the fear of losing power by becoming dependent on external partners. In addition, the emotional bond and its effect were reinforced by the employees' identification with the family business; other reinforcing factors were a strong intention to control and the length of family ownership. On the contrary, succession had a positive effect because the integration of a new family member reduced the emotional attachment (Kotlar et al. 2020). Similarly, an increased concentration of power had a positive effect on potential AC. If knowledge expansion is prioritized, such expansion can be promoted by reduced bureaucracy, for example. Finally, positive effects associated with underperformance or the expected loss of control in the future emerged because R&D and rational decisions increased under such circumstances to save the family business.

However, these aforementioned effects on potential AC have an opposite effect on realized AC. Emotional attachment positively affects the realized AC. The reason is that the investment in potential AC focuses on efficient knowledge utilization to develop and strengthen products, services, and processes. Similarly, a long period of family ownership has a positive effect on AC, as older family owner relinquish more trust and thus more decision-making power to non-family members. By contrast, succession by a new family member and the associated ownership transfer reduce the management's familiarity with internal knowledge and thus the ability to implement knowledge in the family business (Kotlar et al. 2020). The concentration of power has a negative effect on realized AC. Decisions regarding knowledge application are made by authoritarian family members, and experienced employees are excluded from the process, thereby diminishing the employees' commitment (Kotlar et al. 2020). The concentration of power is reinforced by the presence of a family CEO (chief executive officer) and family members in top management. By contrast, a high degree of diversification of family ownership and institutional investments brings a positive effect to realized AC (Kotlar et al. 2020).

Rondi and Rovelli (2022) analyzed the influence of the family firms' top management team (TMT) on knowledge transfer and the realization of innovation opportunities. Their results indicated that a positive influence was not associated with the diversity of TMT alone (i.e., family members and non-family members) but that the depth of the CEO's search for external knowledge was also important. The diversity of the TMT only affected knowledge transfer positively if the CEO refrained from conducting an external knowledge search. If the CEO prioritized the search for external knowledge, then the effect of diversity could become negative rather than positive. In this scenario, the CEO does not seek an exchange with the TMT but independently decides on the specific knowledge that is needed to realize innovations (Rondi and Rovelli 2022). Hence, both the TMT and the CEO influenced the transfer of knowledge and the resulting innovations. In addition, the transfer of knowledge between family members impacted new developments. The idea that family members can absorb and internalize each other's specific knowledge is crucial (Chirico and Salvato 2016).

Previous studies adopting the behavioral approach have shown that various influencing factors of families can affect AC. These factors generate different outcomes regarding potential AC and realized AC and provide insights into the heterogeneity of family firms.

5.3 Outcomes of potential and realized absorptive capacity

The willingness to change and the successful implementation of AC produce heterogeneous results in family businesses. For example, small family businesses can increase their ability to competitively operate through cooperation (Boyd and Hollensen 2012). Family firms that transform internal and external knowledge into products and services exhibit high performance (Hernández-Perlines et al. 2017). In particular, the combination of internal and external R&D engenders the superior performance of family firms compared to non-family firms (Muñoz-Bullón et al. 2020). This pattern is reinforced when the family business starts off below par in its performance. To reach a normal state, the family business must take a risk to generate innovation and protect its SEW by conducting more internal and external R&D (Muñoz-Bullón et al. 2020).

Entrepreneurial and technological forms of orientation similarly lead to high performance. According to Chaudhary and Batra (2018), the increase of AC, especially realized AC, improves entrepreneurial and technological orientation. On the one hand, an entrepreneurial orientation enables the identification and evaluation of new opportunities and, in turn, the formation of AC. Furthermore, it induces a proactive action and creates a sustainable competitive advantage under changing environmental conditions; it is also associated with innovative solutions and the accurate calculation of risks (Chaudhary and Batra 2018; Hernández-Perlines et al. 2017). On the other hand, a technological orientation stimulates the ability to rapidly build new technologies from existing knowledge. Thus, it facilitates the response to changing customer needs and technologies and boosts performance (Chaudhary and Batra 2018). Similarly, AC positively moderates the impact of an entrepreneurial orientation on international performance. In addition, AC counteracts the external pressure on the family business because knowledge is recognized; hence, AC enables the discovery of new resource applications (Hernández-Perlines 2018). Environmental conditions can reinforce this positive effect (Hernández-Perlines and Xu 2018).

Furthermore, family businesses can react swiftly and flexibly to critical situations and problems through the absorption and integration of customer and employee feedback as well as employee experiences (Boyd and Hollensen 2012). This swift

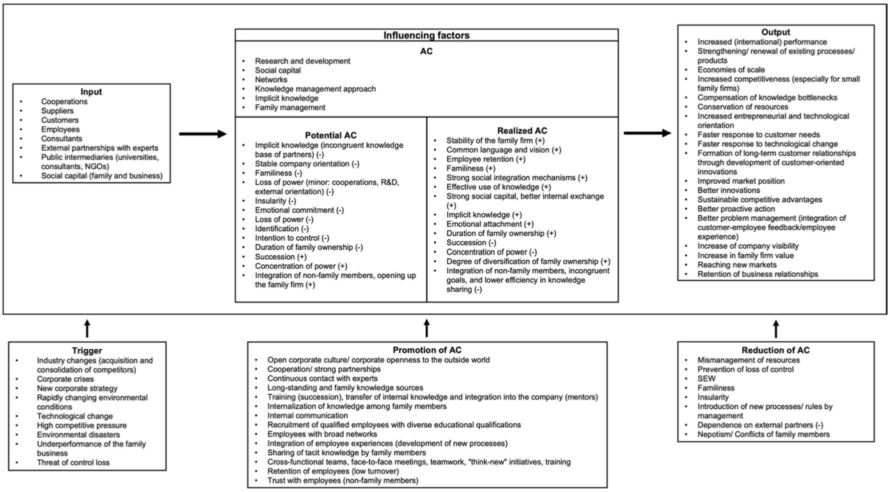


Fig.6 Schematic summary of the core results of the analyzed articles

and flexible reaction can be promoted via social media. In their study, Cepeda-Carrion et al. (2022) found that companies use social media to exchange information with stakeholders and, as a result, achieve an increase in open innovations. AC plays a key role in this process by partially mediating this effect. AC can help with maximizing the potential of social media by filtering relevant knowledge and bringing it into the company. This generated information can then enhance the exercise of open innovations. In addition, AC can add value for customers through changes to existing processes and products or an expansion of offerings (Gancarczyk and Gancarczyk 2016). Through AC, customer-driven innovations can be developed. In turn, these innovations can produce added value, such as the capacity to reach new markets (Gancarczyk and Gancarczyk 2016). The dynamic ability to respond to customer needs is especially important for SMEs to maintain their business relationships and obtain external information and knowledge (Gancarczyk and Gancarczyk 2016). Furthermore, the aforementioned points can improve customer and employee satisfaction, which in turn enhances the company's visibility and (international) competitiveness (Boyd and Hollensen 2012).

In summary, previous research of AC in family businesses has shown positive outcomes (Fig. 6).

6 Directions for future research

Our analysis indicates that the adoption of a behavioral approach and an involvement approach generates different views and results with regard to AC in family businesses. Only a few studies have applied the behavioral approach, even though this approach was developed to analyze the heterogeneity of family firms (Chrisman et al. 2005; Chua et al. 1999). The studies analyzed in the current research mainly used the involvement approach, which has a limited capacity to account for the specificities of family firms (Anglin et al. 2017; Handler 1989). To gain further insights, we suggest eight propositions for future exploration. These propositions help to clarify some key aspects of potential AC and realized AC in family firms and the influence of family members.

The influence of family members can be captured by drawing on familiness and SEW (Berrone et al. 2012; Frank et al. 2017). The studies analyzed in the present research revealed that the inclusion of familiness was based on the definition by Pearson et al. (2008), who described familiness in terms of family social capital. This point reflects a vital aspect in the context of AC, as social capital is required for the availability and transfer of knowledge. However, other aspects can also strongly influence the AC process, such as ties to the region, qualifications of family members, and employee satisfaction (Basco 2015; Diéguez-Soto and Martínez-Romero 2019). These aspects are, for example, evident in the multidimensional family influence constructs of Klein et al. (2005) and Frank et al. (2017). Therefore, future research should refer not only to Pearson et al. (2008) in the context of familiness but also to the definitions by Habbershon and Williams (1999), Sirmon and Hitt (2003), Irava and Moores (2010), and Naldi et al. (2008). Moreover, the operationalizations provided by Frank et al. (2017), Rutherford et al. (2008), and Klein et al. (2005) should be examined in this context. Only the study of Pütz et al. (2022) uses the operationalization of Frank et al. (2017). Additionally, the issues raised by Kotlar et al. (2020) are essential, and the constructs should be viewed from a dynamic perspective. For example, a strong expression of familiness can produce a relatively poor AC, but it can also turn in the opposite direction and result in a relatively strong AC.

Proposition 1 *Various operationalizations of familiness need to be explored, as the different dimensions can yield different results in the context of AC.*

The individual dimensions of the constructs should not be neglected. Their absence or presence can strongly influence the integration of AC and the associated outcomes (Andersén 2015; Belkhodja and Daghfous 2021; Daspit et al. 2019). For example, Kotlar et al. (2020) concluded that identification with the family business caused a negative effect on potential AC and a positive effect on realized AC. Similarly, Jocic et al. (2021) investigated the influence of familiness on innovations and found that power had a negative effect on innovations, whereas experience and culture had positive effects. Other factors that might positively affect AC include the qualifications of family members in the company, social activities in the region, as shown by Pütz et al. (2022), and the presence of permanent staff (De Massis et al. 2018b; Diéguez-Soto and Martínez-Romero 2019; Frank et al. 2017). Hence, considering not only a familiness construct as a whole but also its sub-dimensions is important.

Proposition 2 *The various dimensions of familiness and their manifestations can have differing effects on AC; therefore, they should be considered individually.*

The preceding discussion is especially relevant to SEW, whose consideration in the context of AC has been marginal (Brinkerink 2018; Kotlar et al. 2020; Muñoz-Bullón et al. 2020). The affective needs of the family should be included in a study to examine the main family influences and decisions regarding the family business (Daspit et al. 2021; Gómez-Mejía et al. 2007). These aspects can strongly impact the use of AC in the family business. The protection of the reputation of the business and the family is often associated with SEW, which is generally accompanied by a strong stakeholder orientation and socially responsible behavior (Gómez-Mejía et al. 2011). The aforementioned aspects may allow the family business to access external knowledge because the business is trusted by its stakeholders who are therefore likely to share their knowledge (De Massis et al. 2018b; Pütz et al. 2022; Wang 2016a). In addition, the image of the family business can have a positive impact on exploitative innovations. Family businesses develop a stronger stakeholder focus to maintain their image, which boosts the awareness of stakeholder needs (Arzubiaga et al. 2019). By contrast, a focus on maintaining reputation can block other processes in the company; for example, funds for innovation and development might be cut, which in turn would reduce AC (Gómez-Mejía et al. 2007).

Previous research on SEW and innovation has indicated that the goals of the family and the salience of each dimension matter. Li and Daspit (2016) inferred that a negative effect arose through strong intentions to exert control. With increasing control intent, family members try to maintain their control and behave in a risk-averse manner. A similar pattern is evident in the context of R&D. When the family holds a high financial stake in the firm, it acts in a risk-averse way to protect its SEW. However, if the financial stakes are relatively low, the family's SEW is not at risk, and the family may invest in R&D to promote the longevity of the business (Sciascia et al. 2015). These examples illustrate how SEW can affect family business decisions. The same effects and other outcomes can emerge in the context of AC. However, both SEW and the strength of the various dimensions should not be viewed simplistically. All these elements can play key roles in the formation and exercise of AC. For this reason, the inclusion of the SEW construct in the study of family influence is vital. Moreover, the investigation should not only be limited to the construct as a whole but should also consider its dimensions.

Proposition 3 *The affective needs of the family can influence the performance of AC in the family business; the influence can be positive or negative depending on the degree of the dimensions.*

Proposition 4 *The individual dimensions of SEW can have different effects on AC; therefore, they must be considered separately.*

To date, the behavioral approach – including familiness and SEW – has been heavily involved in theoretical work. Further empirical research is required in this context in the future, using quantitative methodologies such as the one adopted by Pütz et al. (2022). This methodology could help to verify the previous theoretical results and uncover possible dynamics.

Proposition 5 *The behavioral approach in the context of AC needs to be applied quantitatively to examine inferred relationships and test for generality.*

Another approach that was disregarded in the reviewed articles is the identity approach. Its explicit consideration is worthwhile, as this theory addresses the identity of family members and internal and external stakeholders in a family business (Zellweger et al. 2013). Identification with the business is established through its history and lived values, which in turn are created through family involvement (Zellweger et al. 2010, 2013). Members of the company feel being a part of it and view the company's success or failure as their own (Zellweger et al. 2010). Such identification engenders a positive attitude toward the company and positively influences work practices; employees go above and beyond the normal scope of their work and actively use their knowledge to accomplish new tasks (Ashforth et al. 2011; Zellweger et al. 2010). This positive effect can extend to external stakeholders who have an interest in the company's success; they identify with the company and thus (for example) share their knowledge to promote the company's performance (Ashforth et al. 2011; Zellweger et al. 2010). These characteristics – both internal and external – may have a positive effect on AC in family firms because external knowledge can be accessed and internal knowledge can be processed. Despite the little analysis in this regard, initial research indicates a positive effect of organizational identity on AC (Anand et al. 2013; Lee et al. 2014). Given that a family business builds a distinctive identity through its history and values, the strong expression of that identity and its living out by family members should build AC within the business. Research is needed to determine the impact of a family business' identity on AC and how such an identity can be built among members or focused on enhancing AC.

Proposition 6 *AC can be fostered through the formation of identity among internal and external stakeholders regarding the family business.*

In addition to the various influences of the family on the business, contextual factors may play a decisive role. These factors can affect the family and its decisions and actions (Zellweger et al. 2013). For example, external factors such as local circumstances, local affiliations, and country-specific values can influence family values (Khanin et al. 2022; Zellweger et al. 2013). In turn, those values can impact the exercise of AC (De Massis et al. 2013). The establishment of social capital, collaborations, engagement with employees and stakeholders, and the evaluation of innovations are consequently affected (Chua et al. 2012). These aspects are important in relation to AC because they are needed for access to external knowledge and its integration in the company (Cohen and Levinthal 1990; Gómez-Mejía et al. 2007). The influences of external contextual factors on the family business and its members require analysis in the future.

Proposition 7 *External or contextual factors that influence family members and the family business can affect the implementation of AC.*

Aside from external factors, internal factors may have an impact on the family and the company. Knowledge is acquired with age and size; hence, the founding generation is expected to have less AC than subsequent generations (Chirico and Salvato 2016). However, the issue of whether a younger generation will experience more AC remains uncertain. If that generation has many networks, partnerships, and stakeholders as well as vast knowledge, then it might actually incur a negative effect due to high costs and ample efforts. In addition, relevant or trivial information must be filtered out from these comprehensive resources (Pillai et al. 2017). Furthermore, previous research has indicated that younger generations differ from the first generations in their relationship to the family business. If attachment is high in the first generation, then its decrease over time tends to occur, which has been shown to have a positive and a negative effect on AC (Kotlar et al. 2020). The number of generations represented in the family business can also influence AC. For example, a younger generation is often overruled by the older generation, causing difficulty in the implementation of new ideas and concepts (Chua et al. 2012). This tendency can affect the new generation's use of social capital or new thinking within the combination of knowledge. However, the older generation has more tacit knowledge, which has a positive impact on AC (Duh 2014). Similarly, the number of individual family members can have an impact. People's different affective needs create the potential for conflict, which can influence strategic decisions such as knowledge transfer (Chirico and Salvato 2016). Finally, AC in the family business can be viewed from a "not-invented-here" perspective. Antons and Piller (2015) describe such perspective as "a negative attitude toward knowledge (ideas, technologies) derived from an external source" (p. 193). This viewpoint can provide insight into why successful family businesses close themselves off from the outside world and exhibit limited potential AC (Antons and Piller 2015). Therefore, internal factors should also be considered in future research.

Proposition 8 *Internal factors that influence family members and the family business can have an impact on the implementation of AC.*

7 Discussion

This literature review conducted in this study is the first to summarize the research on AC in family firms. The results show a strong influence of family and management on AC, reflected in a different expression of the AC dimensions in family firms. Potential

AC is often avoided because of the family members' fear of losing their power within the company. By contrast, realized AC is executed more strongly. Family firms benefit from its implicit knowledge, and the family's exploitation of new knowledge is enhanced. However, to date, only a few studies have examined the characteristics of the family in the context of AC, resulting in the lack of an in-depth investigation. Although the family firm is one of the most common types of firms (De Massis et al. 2018a; Wolter and Sauer 2017), our analysis has indicated that family firms have been rather neglected in AC research. Only a few studies that include the characteristics of family firms in their analysis are available – a finding that we did not expect. However, the differences between non-family and family firms and the heterogeneity between family firms have been well established in research. Various studies have shown that the two forms of businesses widely differ in their behavior due to the influence of the family on the firm (Berrone et al. 2012; Chrisman et al. 2012; Daspit et al. 2021).

Previous research has identified both the advantages and disadvantages of family firms in terms of AC implementation through the involvement of family members. Regarding the family's influence and resource integration, an ambivalent situation seems to evolve in the family firm context. That is, the specific characteristics of the family and the firm exert a strong influence on AC, whether positive or negative. Several researchers have emphasized that family businesses are characterized by their good relationships with stakeholders and that employee ties and alliances are built across generations (Bingham et al. 2011; De Massis et al. 2018b; Miller and Le Breton-Miller 2005). The social capital of the family is similarly underscored, especially in the context of familiness (Pearson et al. 2008; Zellweger et al. 2010). However, our literature analysis of family businesses and AC yielded different results. For example, familiness and the multiple dimensions of family ownership were associated with both positive and negative results in this context. Family members may isolate themselves externally and internally so as not to relinquish their power (Andersén 2015; Daspit et al. 2019; Kotlar et al. 2020). This view is primarily a theoretical conclusion (Andersén 2015; Daspit et al. 2019; Kotlar et al. 2020); consequently, a first important preliminary result of our study is that these assumptions require an empirical testing.

8 Conclusion

In this study, we conduct a literature review to obtain an overview of the existing research on AC in family firms and answer the research question, to what extent the characteristics of family firms influence absorptive capacity outcomes. We have shown that the research field of AC and family business is still in its infancy and that further studies are required to understand the heterogeneity of family influence on AC. Family firms affect the exercise of AC and their dimensions in different ways due to the influence of family members. The expressions of familiness and SEW impact the family's actions and thus the implementation of AC.

Our results indicate that only the selected dimensions and operationalizations of the factors constituting family influence have been analyzed in terms of their impact on AC. Only one analysis (i.e., by Pütz et al. 2022) of all the dimensions as reflected in the FIFS construct has been conducted thus far (Frank et al. 2017; Habbershon and Williams 1999). Only a few studies reveal the ambivalent results of the impact of the family on AC; thus, further studies should verify the specific characteristics of the family within the overall construct as well as the individual dimensions to further clarify the influence of the family on AC. In this regard, the behavioral approach should be considered. In addition to familiness, researchers should focus on the influencing factors related to SEW and the relationships among family members. This focus could explain the heterogeneity of family firms and the issue of why some family firms are more successful than others. Furthermore, as the long- or short-term orientation of the family may affect the AC dimensions, this factor should be similarly considered.

Our study also provides important practical implications. When AC is successfully implemented, the family business can react swiftly and flexibly to changing environmental conditions such as evolving industry structures, new technologies, and business crises (Boyd and Hollensen 2012; Eisenhardt and Martin 2000; Zahra and George 2002). However, family characteristics such as control intention or power preservation can influence this process either positively or negatively (Andersén 2015; Daspit et al. 2019; Kotlar et al. 2020). Family businesses should understand these effects because AC constitutes an important capability of the business to address dynamic environmental changes (Eisenhardt and Martin 2000).

This study was conducted systematically, but it has certain limitations. First, only articles found in the screened databases were analyzed or relevant articles that they cited. The keywords for this search were substantially limited in the scope of AC and could have been expanded with synonyms, but were chosen to keep the focus on the topic. Second, only English articles were considered; papers written in other languages – as well as working papers, conference papers, and books – were excluded from the analysis. Relevant knowledge might have been found in other sources, but journal articles represent the scientific standard and communication. Third, our selection was limited to listed international journals in the Academic Journal Guide 2020 or by VHB ranking to ensure the quality of the articles. Removing this criterion would have resulted not only in the inclusion of more relevant articles but also in a lower level of validated knowledge, as not all articles share the same qualitative standard. These points and a field of research that is still in its infancy led to a limited number of 27 articles. The small number of analyzed articles resulted in a focused but reduced validity of the findings.

In sum, we encourage future researchers to focus on the impact of family members on AC. Researchers should also examine the external and internal factors that influence family members and their actions. External factors pertain to stakeholder pressure and region-specific values and behaviors, whereas internal factors include generations, nepotism, and conflicts between family members. Moreover, when the number of articles in this research area has increased in the future, the validity of the main results should be tested via a meta-analysis. The relevance of knowledge creation and the particular qualities of family businesses is growing in an increasingly knowledge-based society.

Appendix

See Tables 5, 6 and 7.

Table 5 Content analysis of antecedents of absorptive capacity in family firms

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Boyd and Hollensen (2012)	–	Qualitative/ Case study	1 family firm	L	Denmark	AC is initiated by situational and structural triggers. Family businesses must break away from the old way of doing things and act flexible. Use of personal competencies and their knowledge (potential AC) for the development of corporate competencies (realized AC) in order to build up (international) competitiveness. Cooperations can help small family businesses in particular to act competitively
Duchek (2015)	–	Qualitative/ Case study	2 family firms engineering industry	L	Germany	An increase in AC cannot be brought about by introducing new rules or processes imposed by management. Employees introduce these and decide which processes are helpful and are implemented

Table 5 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Duh (2014)	Knowledge creating theory	Conceptual	–	S, M	–	Succession must be seen and used as a process for building AC. Early involvement of the successor in the family business through mentors, for example, passes on tacit knowledge as well as skills, values, and behavior, which increases the knowledge base of the successor, thus building AC in the area of assimilation. Likewise, general education has an impact on AC as it provides a basis for new ideas and integrates new management and business trends into the family business
Filippini et al. (2012)	–	Qualitative/ Case study	2 firms	S, M,	Europe (Italy & Swiss)	In the family business, the balance between tradition and innovation of viticulture are paramount. The long time horizon of the family business and its stable environment allowed the owner to build strong external partnerships to absorb knowledge. These long-term partnerships led to a strong relationship, the building of a common language and values, improving knowledge sharing. Continuous training and contact between experts and employees strengthen the partnership and knowledge sharing

Table 5 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Klewitz et al. (2012)	–	Qualitative	7 firms	S, M	Germany	Family businesses with a weak AC can be helped by public intermediaries (e.g., NGOs, universities, consultants). These provide access to knowledge and help to use it
McAdam et al. (2010)	–	Qualitative/ Case study	1 family firm	S, M	United Kingdom (UK)	Family businesses can also increase realized AC through the targeted promotion and development of potential AC among employees. The permanent scanning of the environment can be promoted by a diversity in the selection of the employees, since thereby different abilities and networks are available to the family enterprise. Likewise, good communication must be established in the family business, e.g., through open-plan offices, cross-functional teams, or team meetings

Table 5 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Pütz et al. (2022)*	Dynamic capability theory Signaling theory	Quantitative	327 family firms	S, M	Germany	Family businesses that have a high level of familiness have an advantage in exercising AC. In this context, AC is mediated by corporate social responsibility (CSR). Familiness is partially mediated on potential AC by customer-oriented CSR measures. For realized AC, it is fully mediated by customer-oriented and employee-oriented CSR measures
Wang (2016a)	Stewardship theory	Quantitative	137 family firms	S, M	United Kingdom (UK)	It could not be proven that environmental dynamics have a positive influence on AC. Likewise, it could not be proven that trust moderates this relationship. Only a positive effect of trust on AC can be demonstrated

S small, *M* medium, *L* large firms

*Relevant articles published only as online first until the date of the search (End of October 2022)

Table 6 Content analysis of family and firm influence on absorptive capacity in family firms

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Andersén (2015)		Conceptual	–	–	–	Familiness has a negative effect on potential AC, as family businesses have specialized knowledge and are inward looking so as not to cede power. Familiness has a positive effect on realized AC, as family businesses have more pronounced social integration mechanisms and stability that enable more effective implementation. Family businesses in a stable environment can compensate for lower potential AC because they do not rely on rapid innovation and have more time to exercise potential AC and implement it successfully

Table 6 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Belkhodja and Daghfous (2021)	Grounded theory	Qualitative/ Case study	3 family firms	S, M, L	United Arab Emirates (UAE)	Within the three knowledge management approaches, implicit, explicit, and strategic, the strategic approach is best suited to foster social capital of non-family members and AC. It considers internal as well as external knowledge. Familiness reduces insularity, promotes diversification of knowledge sources, leads to shared vision and better social integration mechanisms. Through increased engagement of non-family members, family members have more trust and therefore promote its social capital

Table 6 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Belkhodja (2022)	Knowledge based view	Qualitative/ Case study	2 family firms	S, M	United Arab Emirates (UAE)	Family businesses that are able to balance the exploration and exploitation of knowledge, are market-oriented, and recognize that securing a sustainable competitive advantage depends on the family business' ability to maintain its existing operations and routines and invest in improving profitability and growth. Knowledge management processes must be paired with the appropriate ACs to achieve optimal value creation In this context, the dominance of a few family members and their control over key strategic decisions can hinder important knowledge integration mechanisms and thus negatively affect the knowledge management process

Table 6 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Brinkerink (2018)	–	Quantitative	346 manufacturing enterprises	S, M	Dutch	Compared between family businesses and non-family businesses, family businesses have a lower potential AC. However, they have more pronounced social integration mechanisms and can perform realized AC more effectively. The moderation of R&D intensity on exploitative innovation is more positive in family firms than in non-family firms due to better use of tacit knowledge and long-standing external knowledge sources

Table 6 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Chirico and Salvato (2016)	–	Quantitative	967 firms	–	Swiss	Product development depends on how the family members can absorb and thus internalize their specific knowledge among each other. This is positively influenced by social capital and affective commitment and negatively by relationship conflicts. This effect is in turn influenced by the controlling generation, which increases the effect of social capital and reduces the negative effect of conflicts

Table 6 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Daspit et al. (2019)	Dynamic capability perspective	Conceptual	–	S, M	-	Family members among themselves exhibit poorer potential AC because of increased insularity. Within realized AC, they can achieve better innovation results, since they can build complex knowledge structures through a common language and vision, which leads to effective implementation The integration of non-family members has a positive effect on insularity and potential AC, as they open up the family business. On realized AC they have a negative effect due to incongruent goals and lower efficiency of knowledge sharing

Table 6 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Diéguez-Soto and Martínez-Romero (2019)	SEW approach	Quantitative	454 firms	S, M, L	Spain	Family involvement in management has a positive effect on intramural R&D (proxy for AC) and extramural R&D. This is because a higher number of family members in the company reduces the risk aversion, and the long-term orientation comes to the fore, as well as a congruence of economic and family-centered goals can be achieved Likewise, intramural R&D and the combination of intramural and extramural R&D have a positive partial mediating effect on product innovations. The direct effect of family management on product innovations is negative, which can be triggered by the dark side of SEW (e.g., nepotism, intensified conflicts)

Table 6 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Eniola (2022)*	–	Qualitative/ Case study	3 family firms	S	Nigeria	Owner-managers of small family businesses have the quality to act as gatekeepers. They can promote AC by developing internal processes and practices through external communication and knowledge absorption. But they are limited in their role as gatekeepers through family ties

Table 6 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Kotlar et al. (2020)	–	Conceptual	–	–	–	Family ownership has an impact on potential AC and realized AC through emotional attachment and power bundling. Emotional attachment and power bundling each have opposite effects on potential AC and realized AC, resulting in a motivation gap or implementation gap. This can be influenced by events such as the duration of family ownership, handover of the family business, identification, family member involvement, control intention, underperformance, or threat of power loss

Table 6 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Rondi and Rovelli (2022)	–	Quantitative	237 firms	S, M, L	Italy	Family businesses show a lower realization of innovation opportunity than non-family businesses. This is related to the top management team (TMT) and its knowledge transfer, as well as the CEO (chief executive officer) search for external knowledge. When a low CEO search is present, non-family members and their search have a positive effect on knowledge transfer. A strong CEO search prevents knowledge transfer in the TMT, because the CEO decides independently what should be implemented in the family business
Sánchez-Sellero et al. (2014)	–	Quantitative	20 manufacturing sectors	S, M, L	Spain	Family management has a negative effect on AC

Table 6 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Wang (2016b)	Social capital theory	Quantitative		S, M	China	Social capital in the forms of structural, cognitive, and relational capital have a positive effect on AC, as well as the ability of family businesses to adapt and innovate

S small, *M* medium, *L* large firms

*Relevant articles published only as online first until the date of the search (End of October 2022)

Table 7 Content analysis of outcomes of absorptive capacity in family firms

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Cepeda-Carrion et al. (2022)*	–	Quantitative	113 family firms	S, M, L	Spain	Absorptive capacity plays a key role between the use of social media and open innovation and mediates this. In this context, the use of social media is an important factor for open innovation and the acquisition of external knowledge. In order to use the knowledge gained via social media and thus promote open innovation activities, AC and specific processes and routines are needed within the company
Chaudhary and Batra (2018)	–	Quantitative	272 family firms	S, M	India	AC leads to an increase in entrepreneurial and technological orientation. By combining internal and external knowledge, family firms can respond more quickly to changing customer needs and technological change, which leads to an increase in performance

Table 7 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Gancarczyk and Gancarczyk (2016)	–	Qualitative/ Case Study	1 family firm transport, shipping and logistics industry	M	Polish	SMEs must adapt to the needs of customers through AC and develop customer-oriented innovations. This allows them to respond dynamically and maintain long-term relationships as well as a better market position. For example, through upgrading, transport companies can expand their services to include shipping and logistics and increase their value and competitiveness through different solutions for the customer
Hernández-Perlines (2018)	Dynamic capacity theory	Quantitative	218 family firms	–	Spain	AC has a positive moderating effect on entrepreneurial orientation and international performance. Companies can counteract external pressure with AC
Hernández-Perlines et al. (2017)	–	Quantitative	218 family firms	–	Spain	AC mediates the relationship between entrepreneurial orientation and family business performance. entrepreneurial orientation enables family businesses to build AC by identifying and evaluating new opportunities

Table 7 (continued)

Author (Year)	Theory	Method	Sample size	Company size	Country of study	Key findings
Hernández-Perlines and Xu (2018)	–	Quantitative	218 family firms	–	Spain	AC mediates the relationship between international entrepreneurial orientation and international performance in family businesses. The international entrepreneurial orientation serves as a background for AC. In turn, the (turbulent) environment has a mediating influence on AC
Muñoz-Bullón et al. (2020)	Behavioral theory Resource-based view	Quantitative	3547 manufacturing firms	S, M, L	Spain	Family businesses show a higher innovation performance with the combination of external and internal R&D than non-family businesses. This effect increases when the performance of the family business is below performance. Family members are less concerned about using external knowledge if it can protect the family business

S small, *M* medium, *L* large firms

*Relevant articles published only as online first until the date of the search (End of October 2022)

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Declarations

Conflicts of interest There are no conflicts of interest.

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