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The Role of Networks for Radical Change in Family firms: A Systematic Literature Review

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Abstract: In this literature review, we explore the pivotal role of family firms' networks (e.g., relationships with employees, suppliers, or customers) in the detection and implementation of radical change. Prior research has mostly taken an isolated perspective, studying only one or two of the three fields "family firms," "networks," and "radical change." We provide a comprehensive synthesis of existing literature, including 79 scholarly papers and use the Input-Process-Output (IPO) framework as an organizing instrument to analyze insights from research on family firms, networks, and radical change. We develop a research agenda targeted at linking networks, radical change detection, and radical change implementation in family firms, highlighting that family firm networks, with their distinct configurations and behaviors, can significantly influence the success or failure of radical change adaptation.

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Empresa familiar, red, social capital, cambio radical, revisión sistemática

El papel de las redes en el cambio radical de las empresas familiares: Una revisión sistemática de la literatura

Resumen: En esta revisión bibliográfica, exploramos el papel clave de las redes que mantienen las empresas familiares (por ejemplo, las relaciones con empleados, proveedores o clientes) en la detección e implementación de cambios radicales. Buena parte de las investigaciones anteriores han adoptado una perspectiva individualizada, estudiando sólo uno o dos de estos tres campos «empresas familiares», «redes» y «cambio radical». Este trabajo ofrece una síntesis exhaustiva de la bibliografía existente de esos tres campos en su conjun-to, que incluye 79 artículos académicos. Para su análisis, se utiliza el marco Input-Process-Output (IPO) como instrumento organizativo. Desarrollamos una agenda de investigación dirigida a vincular las redes, la detección del cambio radical y la implementación del cam-bio radical en las empresas familiares, destacando que las redes de empresas familiares, con sus distintas configuraciones y comportamientos, pueden influir significativamente en el éxito o el fracaso de la adaptación al cambio radical.

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1. Introduction

Networks can have a crucial impact on the behavior of all firms, including family firms, both positively and negatively (Adjei et al., 2019). Positive effects comprise leveraging close-knit, informal networks (Karlsson, 2018), and supportive connections (Hayward et al., 2022) for innovation, while negative effects include less explorative behavior (Ceipek et al., 2021), and reduced ability to initiate change (Cater & Schwab, 2008). Ultimately, networks impact, amongst other factors, radical change adoption and hence the long-term success of the firm (Ciravegna et al., 2020). Extant research showed that family firms display both, different network configuration compared to nonfamily firms (Bika & Frazer, 2021; Carney, 2005; Kandade et al., 2021) as well as heterogeneous behavior when detecting and implementing radical change[1] (Covin et al., 2016; Nieto et al., 2015; Shepherd et al., 2020), due to complex dynamics in family firms (Maseda et al., 2022).
More specifically, family firm networks typically display close-knit (Karlsson, 2018), homogenous ties (Lester & Cannella, 2006), limiting the integration of external knowledge (Brinkerink, 2018; Nieto et al., 2015) and innovation (Herrero, 2018). Family firm idiosyncrasies, such as social capital (Herrero, 2018; Sherlock et al., 2023) and familiness (Carnes & Ireland, 2013; Zahra et al., 2004) significantly impact family firms, including the adoption of radical change (Kammerlander et al., 2018; Szewczyk et al., 2022), innovativeness (Brinkerink, 2018; Martínez-Alonso, et al., 2022; Matzler et al., 2015; Spriggs et al., 2013), and performance (Anderson et al., 2005; Daspit & Long, 2014; Sitthipongpanich & Polsiri, 2015). Family firms might hence face several different challenges based on their network configuration and behavior when undergoing radical change, including recognizing and capitalizing innovation (Bendig et al., 2020; Chirico et al., 2022; Groote et al., 2021; Koka & Prescott, 2008), ultimately impeding the longevity of the firm (Chrisman et al., 2021; Ciravegna et al., 2020). Yet, when high levels of initiative, extensive networking, willingness to take risks, and funding are given, family firms are just as likely as nonfamily firms to achieve radical change (Covin et al., 2016).
Family firms today are facing an increasing number of strategic and economic uncertainties—including heightened market volatility, rising inflation, international geopolitical conflicts, and rapid technological advancements (Bianco et al., 2009; Pantaleo & Nirmal Pal, 2008). These global developments necessitate strategic change and intensify the need for radical change in family firms. As a result, understanding how family firms leverage their networks to navigate these complex transformations is increasingly important. However, in the current research landscape, the three overarching fields of research on family firms, networks, and radical change have not yet been collectively addressed. There are only few, isolated studies on the fields of family firms, networks, and radical change and existing knowledge is fragmented and lacks comprehensive integration. This literature review will address this gap by synthesizing and integrating the scattered insights to provide a cohesive understanding, as radical change has gained importance for family firms. Integrating the fields of family firms, networks, and radical change is critical for three reasons: (1) networks hold substantial importance within the context of family firms (Carr et al., 2011; Zamudio et al., 2014); (2) literature elucidates that networks are essential for implementing radical change (Kumaraswamy et al., 2018; Vardaman et al., 2012); and (3) the necessity for radical change in organizations is ever-increasing in response to ongoing global developments (Pantaleo & Nirmal Pal, 2008). Our aim of this paper is hence to analyze and categorize the current state of research and to create a synthesis of the existing studies, including the configuration and behavior of family firm networks with a focus on radical change detection and implementation. Moreover, we comprehensively integrate the challenges pertaining to the impact on family networks, alongside the discussion of potential strategies to address these issues. The underlying research question of the literature review hence is: *What influence do networks of family firms have on their detection and implementation of radical change?*
Building on the research question posed by Hu and Hughes (2020) “What resource bundles should family firms possess or develop to facilitate radical innovation? Are there specific resource histories and trajectories that create, facilitate, or hinder the family firm in terms of radical innovation activities?” (pag. 1217) —we synthesize insights from three key literature streams: “family firms,” “networks,” and “radical change.” This integration elucidates the mechanisms through which family firms detect and implement radical change through their network. Our comprehensive approach advances the understanding of familiness, networks, and radical innovation, thereby paving the way for future research grounded in the proposed framework.

1. Radical change is defined as firms comprehensively modifying their resources to enhance and sustain long-term competitive advantage (Stopford & Baden-Fuller, 1994), which entails updating and transforming their fundamental concepts (Guth & Ginsberg, 1990) across the organization (Al-Mashari & Zairi, 1999).

To address the research question, we conducted a systematic review of relevant literature. This comprehensive review entails a detailed examination and synthesis of 79 scholarly papers, each specifically focusing on at least two out of the three relevant research areas. A central component of our approach is the use of the IPO (Input-Process-Output) framework, which aids in understanding and interpreting the interactions of family firms within their networks, facing radical change. By structuring the synthesis along the IPO, we can more effectively analyze how the network contributes to the family's firm' ability to detect and implement radical change, thereby providing clearer insights into the dynamics at play.

This literature review makes two contributions to research on the intersection of family firms, networks, and radical change: (1) linking and synthesizing existing knowledge along the IPO framework to improve our understanding of the nexus of the three research fields; (2) elaborating on future research avenues for scholarly investigation based on the identified current research gaps. The literature review links the three fields, highlighting how family firms' unique networks affect their ability to detect and implement radical change. Existing literature is so far lacking the connection of the three fields, as currently only two papers have addressed all three fields (i.e., Brewton et al., 2010; Zahra, 2010), each with a rather narrow focus.[2]. Our review demonstrates that while family firm networks have received considerable attention (e.g., Carr et al., 2011; Ciravegna et al., 2020; Karlsson, 2018; Lester & Cannella, 2006), the aspect of navigating radical change is less explored (Hu & Hughes, 2020), suggesting a crucial direction for future research.

2.Key Concepts and Definitions

The literature review synthesizes the three overarching fields of "family firms," "networks," and "radical change." For the purpose of this literature review, we define family firms as "a business governed and/or managed with the intention to shape and pursue the vision of the business held by a dominant coalition controlled by members of the same family or a small number of families in a manner that is potentially sustainable across generations of the family or families" (Chua et al., 1999, p. 25). We define a network as the interaction of firms (Peña Ramírez & Levy, 2022), with a focus on the relations that a single firm has with others. A firm's networks can for example include relationships with suppliers, customers, lenders, mentors, and competitors (Kilkenny & Love, 2014). As noted in the introduction, radical change is characterized broadly, referring to firms adapting their resources significantly to sustain long-term survival (Stopford & Baden-Fuller, 1994), including a comprehensive overhaul and transformation of core concepts (Guth & Ginsberg, 1990) across the organization (Al-Mashari & Zairi, 1999). We hence understand radical change as an overarching term that encompasses radical innovation with the latter referring to the introduction and commercialization of an entirely new concept in the market (Bouncken et al., 2018; Colombo et al., 2017), including a significantly new or different technology that marks a risky shift from current practices (Bouncken et al., 2018; Garcia & Calantone, 2002).

2. Moreover, we also identified two literature reviews in our systematic literature review, each of them covering only two of the three fields: one review focuses on family firms and radical change (Hu & Hughes, 2020), while the other one explores the intersection of family firms and networks (Stasa & Machek, 2022).

3. Structured Literature Review

We conducted a systematic literature review to develop research questions and educate empirical research practice (Tranfield et al., 2003), exploring and providing a comprehensive synthesis of existing knowledge across the multiple fields (Hatum & Pettigrew, 2004; Hernández-Linares & Arias-Abelaira, 2022; Montiel et al., 2023). This approach allows for the identification of key themes, trends, and gaps within the literature, offering a foundation for future research. By integrating insights from 79 papers, the literature review ensures a holistic understanding of the interplay between family firms, networks, and radical change, thereby guiding the formulation of relevant research questions.

3.1. Literature search process

The literature search involves a structured search process with a predefined search, including keywords and a consistent set of search strings used throughout the process (Tranfield et al., 2003) (see Table 1). Specifically, the process of conducting a systematic literature review consists of five sequential steps (Mertens, 2005): (1) Examining seminal articles to establish key terms; (2) inputting relevant "keywords" and their respective combinations into databases to identify and choose articles pertinent to the defined research topic; (3) analyzing relationships among key terms to uncover commonalities and disparities; (4) constructing a literature map connecting interrelated terms; and (5) continuously updating the literature map and article list during the review, while providing a comprehensive review overview. As we soon realized that there is a void of articles covering all three research streams (i.e., joint search of all three research streams resulted in hardly any results), we also conducted three separate searches, each of them focusing on a combination of two out of the three research streams.

To compile a collection of articles pertinent to the present subject, we implemented filtering criteria, including keywords and associated synonyms extracted from established articles focusing on three predefined combinations: “family firm AND network,” “family firm AND radical change,” and “network AND radical change.” Additionally, we defined synonyms for each overarching keyword to ensure covering all relevant papers. For the keyword “family firm” seven synonyms were defined: “family business,” “family led,” “family owned,” “family company,” “family managed,” “family controlled,” “family involvement,” and “family enterprise” (adapted from Cordoba et al., 2024). For the keyword “network” we identified three additional synonyms: “strong ties,” “weak ties,” and “social capital” (Uhlaner et al., 2015; Salvato et al., 2020). Lastly, for the keyword “radical change” we identified five synonyms based on König et al. (2013) and Hu and Hughes (2020), namely “disruption,” “transformation,” disruptive change,” “discontinuous change,” and “discontinuous technology.” Through the thorough exploration of keywords and synonyms, we prevented the oversight and exclusion of significant journal articles (Kraus et al., 2020).

We restricted our search to peer reviewed articles in English; we excluded scholarly books, conference papers, and research notes from the search. To ensure an overarching, holistic search, there was no restriction to the publication timeframe. The timeframe of articles identified ranged from 1993 to September 2023, from earliest to latest publication. To ensure high quality of the included papers, we focused on the Top 50 Research Journals according to the Financial Times in the structured part of our search and added few additional relevant journals, in particular on the topics of family firm research and innovation: *Family Business Review*, *Journal of Family Business Strategy*, and *Journal of Product Innovation Management*. For reasons of consistency and efficiency, we did not search the websites of the journals directly, yet we carefully selected a database to perform a reliable literature review (Aparicio & Iturralde, 2022). Therefore, we utilized SCOPUS for the systematic search, being the leading curated database for research journals and articles (Cantu-Ortiz, 2018), including all papers from the above-mentioned journals. SCOPUS is a preferred source for extensive data analyses due to its trustworthiness for researchers, universities, and policy makers (Baas et al., 2020).

Table 1: Search protocol

Time period	not limited
Search fields	‘Title,’ ‘Abstract,’ ‘Keywords’
Search keywords	*Network:* (“network” OR “strong ties” OR “weak ties” OR “social capital”) *Family firms:* (“family business” OR “family firm” OR “family led” OR “family owned” OR “family company” OR “family managed” OR “family controlled” OR “family involvement” OR “family enterprise”) *Radical change:* (“radical change” OR “disruption” OR “transformation” OR “disruptive change” OR “discontinuous change” OR “discontinuous technology”)
Search strings	“family firm AND network” “family firm AND radical change” “network AND radical change”
Research journals	Top 50 Financial Times Research Journals + Family Business Review, Journal of Family Business Strategy, Journal of Product Innovation Management (search conducted in database SCOPUS)
Document type	Article or Review
Language	English

The initial search for the defined keyword combinations resulted in a total of 233 articles published in the above-mentioned journals. After screening the titles and abstracts of the articles, we excluded 144 articles, specifically 6 duplications and 138 articles that did not explicitly focus on the search quest. For instance, we excluded articles not focused on the defined research topic, such as those addressing IT, supply chain, or education-related topics. After the initial screening of titles and abstracts, we diligently read the remaining 89 articles. In a following step, we excluded 19 articles that solely emphasized one (rather than two or three) of the three keywords/research fields. Hence, a total of 70 articles remained after the systematic screening. In a next step, we screened previously selected seminal articles for relevant additional papers through backward citation[3]. We identified 9 additional relevant articles to be included in literature review. As of September 2023, we hence identified a total of 79 papers relevant to the topics of family firms, networks, and radical change through a combination of systematic and unsystematic search. Out of the 79 papers identified, a majority of papers (n=49) covered the two keywords “family firm AND network,” while the combination “family firm AND radical change” covered 16 papers. We further identified 12 articles from the general management literature covering “network AND radical change,” and only two papers focusing on all three key words “family firm AND network AND radical change” (i.e., Brewton et al., 2010; Zahra, 2010).

While our primary interest is the effect of networks on family firms undergoing radical change, we still consider identified nonfamily articles as valuable, contributing to the overarching knowledge on network and radical change. We included the keyword combination “radical change AND networks” and hence also searched for nonfamily firm-specific articles dealing with the influence of networks on radical change to provide a holistic overview of literature on the phenomenon. Such approach of including literature on nonfamily firms is in line with other published family firm reviews (e.g., Strike et al., 2018) and ensures to avoid any ‘white spots’ in family firm research and to come up with relevant avenues for further research.

It is important to note that, in order to increase the quality of the literature review, the literature search process included thorough discussions among the two authors about whether to include or exclude certain articles. Both authors independently read the abstracts/articles and formed their own opinion about exclusion vs. inclusion. Discussions terminated when a consensus was reached.

3. The purpose of such an unsystematic literature review approach is to identify papers that (a) are relevant yet use different terms as compared to those used in the systematic part and (b) are relevant (e.g., due to their influence on the field as mirrored in citation numbers) but are published in outlets that were not considered as targets in the systematic part.

3.2 Data analysis

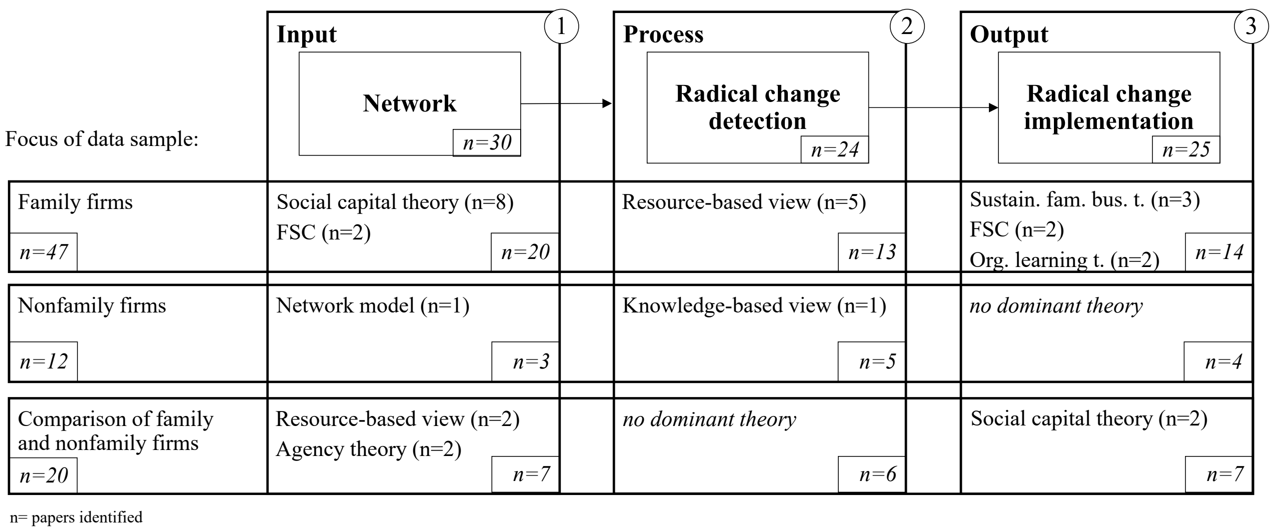
In our analysis, we employed deductive coding, which enabled us to distinctly identify the three unique stages inherent in the IPO framework (see Figure 1). We extracted relevant items from the original articles’ conceptual models, hypotheses, propositions, as well as quantitative and qualitative findings. A synthesis of the coding allowed us to obtain a comprehensive overview of the state of the literature, revealing three distinct streams: (1) network, (2) radical change detection, (3) radical change implementation. We linked the three literature streams to the Input-Process-Output (IPO) framework and defined “network” as input component. Networks are recognized in the reviewed articles as the initial catalyst that can trigger the processes of radical change detection and implementation (Koka & Prescott, 2008; Ramachandran & Ramnarayan, 1993). Following this, we categorized “radical change detection” as the process stage based on the input derived from the firm network allowing change to be identified (Cabrera-Suárez et al., 2011). Lastly, we identified “radical change implementation” as the output, as this step is resulting from the process of radical change detection (Harryson et al., 2008; König et al., 2013) and the active decision to act on radical change (Hall et al., 2001). In this last phase, the knowledge and resources derived from the network are translated into concrete actions and radical change implementation strategies (Brinkerink, 2018).

3.3. Descriptive analysis

By systematically examining each step of the Input-Process-Output framework (Bacq & Lumpkin, 2014), this research endeavor (1) conducts a critical evaluation of the existing literature and (2) discerns and extracts the core research challenges, thereby establishing a research agenda for future investigations concerning family firm networks and their association with radical change (Booth et al., 2016).

Out of the 79 articles in our sample, 42 papers utilize quantitative methodologies, 13 employ qualitative methodologies, 18 are conceptual approaches, two are literature reviews, three are mixed-method papers, and one uses a fsQCA approach. Among 59 papers that explicitly mention a specific theory, 53 applied one theory and 6 applied two theories, with a total of 24 unique theories available in our sample. More specifically, we could identify five major theoretical perspectives in our sample. (1) Social capital theory (n=14) finds its principal utility in the analysis of network dynamics, and hence in the input step. Furthermore, social capital theory is also aptly extended to the study of innovation behavior, particularly in the context of radical change detection. (2) Family social capital (n=6) finds its application within all three steps (input, process, output), underscoring its relevance in analyzing the familial social ties that influence network dynamics. (3) Resource-Based View (RBV) (n=9) is notably deployed when explaining radical change detection, primarily due to its focus on the identification of rare and inimitable resources as a source of competitive advantage (Barney, 1991). Therefore, our findings suggest that family firms require specific sets of resources to remain competitive and adaptive in the face of radical change. (4) Agency theory (n=7) is applied to all three steps in our sample: network, radical change detection, and radical change implementation. Agency theory is often used in conjunction with the RBV due to its emphasis on the principal-agent relationship inherent in network dynamics. (5) Sustainable Family Business Theory (SFBT) (n=4) is predominantly employed in the context of radical change implementation, aligning with its fundamental premise of emphasizing family firm survival, attributed to the unique resource characteristic of family firms (Stafford et al., 1999).

Figure 1: IPO framework with focus on theories utilized



4. Findings

4.1. Networks of family firms

Family firms' networks exhibit unique characteristics that distinguish them from nonfamily firms. Specifically, they focus on ties within close-knit (Karlsson, 2018), homogeneous networks of like-minded companies (Lester & Cannella, 2006), aiming to maintain control and longevity (Ciravegna et al., 2020) (see Table 2). These firms are less likely to be part of business groups and have cross-group ties, therefore being less embedded within such networks (Mani & Durand, 2019) than nonfamily firms. Additionally, family firms construct networks rooted in kinship, ethnicity, community, and political ties, fostering solidarity (Carney, 2005). By forming 'as-if-family' ties, developing non-kin connections grounded in shared values, trust, and compatibility, family firms can enhance knowledge sharing (Bika & Frazer, 2021; Kandade et al., 2021).

Within the field of research on networks and family firms, social capital has increasingly gained attention. Social capital includes internal (bonding) and external (bridging) social capital (Carr et al., 2011). Internal social capital outlines relationships within the firm and external social capital relationships with external stakeholders (Chirico et al., 2022; Herrero & Hughes, 2019). Family social capital dimensions (i.e., structural, cognitive, and relational social capital (Herrero & Hughes, 2019)) describe the network composition of family firms, impacting firm-internal and firm-external relationships (Herrero & Hughes, 2019; Sanchez-Ruiz et al., 2019), with the controlling family and the family firm shaping the family social capital and its strategic outcomes (Anderson et al., 2005). Specifically, extensive structural capital can impede organizations in adapting their strategies, as established networks may restrict their capacity to adopt novel external knowledge (Herrero & Hughes, 2019).

Family firms prioritize internal social capital (Carr et al., 2011), emphasizing bonding over bridging social capital (Zellweger et al., 2019). Bonding social capital is fostered through strong identity and shared vision in family firms (Uhlaner et al., 2015). Leveraging social capital more effectively than nonfamily firms (Ciravegna et al., 2020), close-knit networks of family firms reduce contracting and monitoring costs, fostering long-term success (Karlsson, 2018). From an organizational perspective, family firms are superior at utilizing social capital when connecting with new ventures, accessing novel knowledge (Zahra, 2010). Family social capital contributes to the organizational social capital, by protecting the interest of the firm in a coercive manner, especially highlighting the relevance of organizational identity (Arregle et al., 2007). Family involvement increases community involvement, creating and preserving socio-emotional wealth (Mani & Durand, 2019). While community-level social capital can be beneficial, its impact on individual firms may be relatively modest, as collaboration among firms is in most cases still limited (Lester & Cannella, 2006). Shortcomings in human and financial capital within family firms, leading to higher agency costs (including unfavorable selection of resources, opportunism, and shirking), can be, at least partly, offset by social capital (Levie & Lerner, 2009).

The influence of the family within the network of family firms is ambiguous and can either lower (Daspit & Long, 2014) or boost (Anderson et al., 2005; Sitthipongpanich & Polsiri, 2015) performance. When shifting from a family-centric to a nonfamily-centric external network, family firm owners can increase firm performance by minimizing moral hazards and cost-to-benefit ratios, fostering increased relational independence (Daspit & Long, 2014). Yet also help provided by family members can provide advantages due to their heterogeneous knowledge, and the rapidity of services provided at low to non-existent cost (Anderson et al., 2005). Research found that highly successful managers employ their interpersonal network (mostly friends and family) to a larger extent, unleashing more resources compared to less successful managers (Ramachandran & Ramnarayan, 1993), with closeness of friends being most valuable for social capital generation (Sitthipongpanich & Polsiri, 2015). Especially cultural and geographical variation can explain heterogenous outcomes on the influence of family within the network of family firms (Daspit & Long, 2014; Sitthipongpanich & Polsiri, 2015). Overall, the positive effect of nonfamily social capital in family firms is stronger than that of family social capital, due to higher levels of diversity, professionalism, and salaries tied to firm performance for external management (Sanchez-Famoso et al., 2015).

Family firms, however, also encounter challenges associated with their network structure, including bifurcation bias (Ciravegna et al., 2020) and agency costs (Chrisman et al., 2021; Levie & Lerner, 2009). Specifically prioritizing family assets and relationships impede family firms from fully realizing the longevity of their network connections (Ciravegna et al., 2020). Challenges (e.g., bifurcation bias, agency costs) based on the network configuration of family firms can be resolved by managing altruism, control, social capital, and succession (Chrisman et al., 2021) and by the implementation of governance mechanisms (e.g., contract renegotiations) (Chrisman et al., 2021; Groot et al., 2022), to ensure the survival of (multi-)family firms (Cabrera-Suárez et al., 2015; Groot et al., 2022). Family governance with explicit guidelines, effective communication, and decision-making methods contribute to the stimulation of family social capital, promoting alignment of individual interests with the overall welfare of the family firm, resulting in enhanced resilience (Cabrera-Suárez et al., 2015; Groot et al., 2022). Managers must continuously reassess their network, adjust it according to the environment (Koka & Prescott, 2008), as well as adapt and reshape social relationships when necessary (Salvato & Melin, 2008). By utilizing three steps of corporate diplomacy, (1) familiarization with outside stakeholders, (2) acceptance of corporate values, (3) engagement for stakeholder value creation, family firms can improve their network, increasing the probability for longevity (Ciravegna et al., 2020), building reliable partnerships and social capital, based on vulnerability and mutual engagement (Hayward et al., 2022).

With an increased number of (internal and external) ties, family firm managers maintain connections throughout the network enhancing the controlling family's appropriability and enabling the leverage of family's bridging social capital for accessing external resources (Salvato & Melin, 2008). Access to heterogenous knowledge leads to cost advantages and expanded exchange opportunities (Daspit & Long, 2014; Salvato & Melin, 2008), with higher level of product upgrading associated to the number of ties a firm has with other firms and government support institutions (e.g., public research institutes, training centers) (McDermott et al., 2009).

Table 2: Summarized findings on Input: Network

Paper	Type	Sample	Theory	Findings
Arregle et al., 2007	Conceptual	n/a	SC	FSC contributes to the development of OSC, by protecting the interest of the firm in a coercive manner, focusing on the organizational identity and rationality
Daspit & Long, 2014	Conceptual	n/a (based in Uganda)	SC	Moving from family-dominated external network to nonfamily-dominated external network will positively influence firm performance, increasing relational independence of external network
Lester & Cannella, 2006	Conceptual	n/a (based in the US)	SC	FF operate in a community of similar firms to foster and maintain family control and persistence
Cabrera-Suárez et al., 2015	Quantitative	173 SME FF, Spain (2011)	SC	Structural dimension of FSC has significant impact on the engagement of FF establishment of (corporate goals related to key nonfamily stakeholders)
Carr et al., 2011	Quantitative	341 FF, USA	SC	FF prioritize internal SC, which is largely dependent on family members
Sanchez-Famoso et al., 2015	Quantitative	172 FF in Spain	SC	Positive effect of nonfamily SC on FF is stronger than FSC (due to more heterogeneity, professionalism, and salaries tied to performance)
Sorenson et al., 2009	Quantitative	405 small FF, USA (1997-2000)	SC	Positive relationship between collaborative dialogue and ethical norms, ethical norms and FSC, FSC and firm performance
Uhlaner et al., 2015	Quantitative	679 firms (FF and non-FF)	SC	Positive effects of bonding OSC on bridging OSC FF identity can have a positive moderator effect on network mobilization effect when combined with a strongly shared vision of the firm, regardless of ownership-management overlap
Wu, 2007	Quantitative	108 FF in manuf. sector, Hong Kong	SC	Information sharing plays a mediating role in relationship between different dimensions of SC and firm performance
Hadjielias et al., 2022	Qualitative	62 stakeholders in 23 small privately owned FF, Cyprus	FSC	SC (structural and relational) is reconfigured during external crisis Depending on identification vs. obligation with firm, SC is differently influenced
Groot et al., 2022	Quantitative	175 FF, globally	FSC	Family governance can stimulate FSC by strengthening family identity Family governance helps align individual interests with the collective well-being of the FF, creating resiliency
Karlsson, 2018	Quantitative	89,000 private FF, Sweden (2004-2010)	RBV	FF more than non-FF leverage SC for close-knit, informal networks, reducing contracting and monitoring expenses
Carney, 2005	Conceptual	n/a	Agency theory	FF owners benefit from enhanced networking, creating unique SC and fostering relational contracts with external partners FF managers build connections on solidarity (i.e., kinship/ethnicity/community/political affiliation)
Chrisman et al., 2021	Conceptual	n/a	Agency theory	Interfamily agency problems linked to SC negatively impact the survival of multi FF SC related interfamily agency problems are negatively related to the survival of multi FF
Mani & Durand, 2019	Quantitative	4,983 publicly listed companies (FF and non-FF), India (2001, 2005, 2009)	Behavioral Agency Model theory	Family involvement decrease likelihood of business group affiliation and cross-group ties, being less embedded within overall network Family involvement increases the community involvement preserving and creating socio-emotional wealth

Paper	Type	Sample	Theory	Findings
Kandade et al., 2021	Qualitative	24 next gen. leaders, India (2017)	LMX	□ Relationships with nonfamily stakeholders are crucial for successful businesses □ High-quality relationships developed through mutual respect, trust, early affiliation, mentoring, mutual obligation
Zamudio et al., 2014	Conceptual	n/a	n/a	□ Overview of network measurement (incl. advantages and disadvantages)
Zellweger et al., 2019	Conceptual	n/a	n/a	□ Family ties generate bonding SC rather than bridging SC Different social relationships: (a) intra-family relationships; (b) extra-family relationships; (c) intra-firm relationships; and (d) extra-firm relationships
Stasa & Machek, 2022	Literature review	69 studies (2001-2020)	n/a	□ SC in family firm research is fragmented
Anderson et al., 2005	Mixed methods	68 firms, Scotland	n/a	□ Help provided by family outside the family firm offers heterogeneous resources and perspectives, and rapid services at low to non-existent cost □ 25% of most important network contacts are family and majority works outside family's company
McDermott et al., 2009	Mixed methods	112 wineries, Argentina	n/a	□ Higher level of product upgrading is positively associated with number of ties a firm has to other firms
Bika & Frazer, 2021	Qualitative	55 ff, Scotland (1980s)	n/a	□ FF can build 'as-if-family' ties, with non-kinship-based connections, building on common values shared by emotions, developing trust and compatibility in decision-making
Ramachandran & Ramnarayan, 1993	Quantitative	67 cases of small entrepreneurs, India (1986-1990)	n/a	□ Pioneering entrepreneurs employ interpersonal network to a larger extent
Halinen et al., 1999	Conceptual	n/a	Network model	□ Radical change in a dyad is likely to lead to radical changes in the surrounding network □ Incremental change circle leading to radical change and vice versa
Zahra, 2010	Quantitative	779 manufacturing firms, USA	Relational view theory	□ FF are better in positioning themselves to harvest large OSC stocks, investing in new ventures, learning from innovation and interactions, building knowledge sharing and trust □ FF use OSC to develop alliances and joint ventures
Niemelä, 2004	Qualitative	5 FF (furniture production), Finland (1995, 2001)	Resource dependence theory	□ Owner-managers learned how to use their personal and institutional power to develop their network □ Knowledge, skills, motivation, and volition (willpower), and "affection" are needed to utilize power
Levie & Lerner, 2009	Quantitative	634 surveyed (56% FF), UK (2005, 2006)	RBV, Agency theory	□ Agency costs higher in FF than in non-FF □ FF accept family owner/manager with lower human capital (measured by education level)
Sitthipongpanich & Polsiri, 2015	Quantitative	832 FF observations (excl. banks, finance), Thailand (2001-2005)	RBV, Agency theory	□ Family-led firms' lower firm value (smaller pool of candidates, extract private benefits) □ Connections made by family CEO through directorates have negligible impact and might be similarly gained through interorganizational relationships, where personal friendships hold more value than professional associations
Hayward et al., 2022	Conceptual	n/a	Social Exchange theory	□ Family vulnerability helps develop supportive connections

Paper	Type	Sample	Theory	Findings
Ciravegna et al., 2020	Conceptual	n/a	Transaction Cost Economics (TCE)	To extend nonfamily ties with external stakeholders (bridging SC) three steps required: (1) familiarity, (2) acceptance, (3) engagement FF utilize corporate diplomacy to transfer economizing practices to subsequent generations, to support longevity

Note: Abbreviations used in Table: Family Social Capital (FSC), Family firm (FF), manufacturing (manuf.), Methods (m.), Social Capital (SC), Organizational Social Capital (OSC), Qualitative (Qual.), Quantitative (Quant.), Resource-based view (RBV), Sustainable Family Business Theory (SFBT), Theory (t.)

4.2. Radical change detection in family firms

Literature on radical change detection in family firms is overall embedded in innovation research, with a theoretical focus on familiness (Carnes & Ireland, 2013), social capital (Herrero, 2018; Sherlock et al., 2023), and networks (Brinkerink, 2018; Groote et al., 2021; Nieto et al., 2015) (see Table 3). Familiness[4] can impede radical change detection as it emphasizes stability over pioneering efforts, hindering explorative innovation (Carnes & Ireland, 2013), hence managing familiness is crucial (Irava & Moores, 2010).

Although research on the effect of social capital on radical change is still lacking, some research investigated the relationship between social capital and family firm innovativeness in general. Family social capital can have two contradicting effects on family firm innovativeness, either fostering innovation (Sherlock et al., 2023) or limiting innovation (Herrero, 2018), ultimately suggesting opposite effects on radical change detection. Potentially encouraging radical change detection, increased family social capital can boost innovativeness (Sherlock et al., 2023) through fostering a market-oriented culture (Cabrera-Suárez et al., 2011), knowledge absorption, and product development (Chirico et al., 2022). With human and social capital as positive mediators between family commitment and innovativeness, family commitment enables competitive strategies such as innovation (Sherlock et al., 2023), which foster radical change detection. Contrarily, family social capital may also impede family firms from accepting ideas from external ties (Herrero, 2018), as tightly knit connections restrict members' ability to challenge established norms and explore innovative solutions (Chirico & Salvato, 2016). Family ties with top management fosters consensus and minimizes conflict, thereby diminishing the capacity to detect radical change (Cater & Schwab, 2008).

Family firms tend to rely on long-term, deep relationships in their external network (Brinkerink, 2018), and they are less likely to utilize unknown external sources as they aim to prevent knowledge spill-over to externals (Nieto et al., 2015). Additionally, perception filters (e.g., "not-invented-here") and biases impede incumbent firms from recognizing and capitalizing on opportunities in disruptive technology, hindering innovation (Groote et al., 2021), and ultimately preventing radical change detection. In the context of innovation, family firms demonstrate heightened absorptive capacity for exploitative innovation relative to nonfamily firms, yet they exhibit a deficiency in explorative innovation (Brinkerink, 2018), and this effect is stronger, the stronger the family influence is (Ceipek et al., 2021); hence, family influence encourages incremental change rather than radical change. Strong ties between owning family and managers hinder the ability to detect and initiate radical change, as consensus orientation is increased and conflicts are avoided (Cater & Schwab, 2008).

Three distinct patterns contribute to radical change detection in family firms, primarily emphasizing exploratory innovation through (1) external orientation (Herrero et al., 2022; Nason et al., 2019; Spriggs et al., 2013; Zahra et al., 2004), (2) unprecedented views (Jiang et al., 2021; Nason et al., 2019), and (3) long-term orientation (Cater & Schwab, 2008; Hanson et al., 2019). External orientation encourages entrepreneurship, thereby opening up to heterogeneous knowledge (Zahra et al., 2004). Prioritizing exploratory innovation capacity when engaging with their networks, rather than emphasizing exploitative innovation (Spriggs et al., 2013), will potentially foster radical change detection by absorbing novel knowledge. Nonfamily connections offer diverse, non-redundant, and innovative knowledge (Nason et al., 2019), making novel knowledge more available (Herrero et al., 2022), thus increasing the opportunities for radical change detection. Addressing the challenge of reduced attention to distant knowledge in family firms (Brinkerink, 2018; Piezunka & Dahlander,

4. Defined as unique resources and capabilities derived from the family's involvement and interaction with the firm (Pearson et al., 2008)

2015), network-based knowledge sourcing emerges as a viable solution, offering an alternative to crowd-based approaches and mitigating issues of filtering and disregarding solutions with content and structural distance (Piezunka & Dahlander, 2015). An unprecedented perspective helps managers when dealing with radical change, as those, who react independent of their past experiences, are well-positioned to develop innovative and successful business models (Jiang et al., 2021). When detecting radical change, it is essential for firms to consider different stakeholders, including incumbents and disruptors, within the ecosystem (Kumaraswamy et al., 2018), as increased socializing supports firm managers to recalibrate their knowledge structures, for novel input (Nason et al., 2019).

Table 3: Summarized findings on Process: Radical change detection

Paper	Type	Sample	Theory	**Findings**
Pearson et al., 2008	Conceptual	n/a	SC	□ Familiness creates organizational performance outcome beyond economic performance □ Antecedents of familiness: time, interdependence, interaction, closure
Stanley & McDowell, 2014	Quantitative	149 FF and non-FF (education sector), USA	SC	□ Interorganizational trust, self-efficacy is positively associated with performance in FF and non- FF
Chirico & Salvato, 2016	Quantitative	199 FF (C-level), Switzerland	FSC	□ FSC increases mutual understanding among family members, facilitating knowledge internalization, enhancing product development - Dense social relationships (based on FSC) constrain members ability to challenge existing paradigm and explore creative solutions
Herrero, 2018	Quantitative	230 FF and 170 non-FF in manufac-turing business, Spain	FSC	□ If FSC is high, FF are reluctant to accept ideas coming from others, nonfamily managers can function as moderator when creating strong bonding SC □ FSC has a positive effect on ROE and null eFFect on ROA (oppositive for non- FF)
Carnes & Ireland, 2013	Conceptual	n/a	RBV	□ Resource bundling subprocesses of FF resources can influence innovation outcome: (1) stabilizing, (2) enriching, (3) pioneering
Irava & Moores, 2010	Qualitative	4 FF, Australia	RBV	□ Firms should exploit familiness advantages and manage disadvantages, for long-term performance
Sherlock et al., 2023.	Quantitative	275 FF, globally	RBV	□ Human and SC positively mediate the relationship between family commitment and innovativeness
Zahra et al., 2004	Quantitative	536 manufacturing firms (41% FF), USA (1997)	RBV	□ 4 dimensions of FF culture significantly influence entrepreneurial activities: (1) Individual vs. group, (2) external, (3) short-term orientation, (4) familiness
Hanson et al., 2019	Quantitative	22 family SME (farms), USA	SFBT	□ Families need to identify and comprehend their access to short- and long-term resilience stock □ Relational ethics bridge from past to future
Nason et al., 2019	Conceptual	n/a	Behavioral theory	□ Socialization introduces business-owning families to new actors who bring new information and force a recalibration of the business-owning families' collective knowledge structure
Groote et al., 2021	Qualitative	24 interviews (mail order industry) (9 firms), Germany	Disruptive innovation	□ Perception filters/bias, judgmental overconfidence, and decision-making bias, are negatively linked to innovation □ Not-invented-here syndrome and group-think phenomena support the wrong innovation, which may be even worse than non-innovation

Paper	Type	Sample	Theory	**Findings**
Trantopoulos et al., 2017	Quantitative	>1,072 firms, (manufac-turing industry), Switzerland (2005, 2008, 2011)	Knowledge Based view	□ Firms need to align their strategies for acquiring external knowledge with targeted IT investments to enhance their innovation outcomes
Kumaraswamy et al., 2018	Conceptual	n/a	n/a	□ Papers on disruptive innovations integrate and link various complementary fields such as disruption theory, ecosystems, framing, institutional theory, identity theory, and process theory
Cater & Schwab, 2008	Qualitative	2 firms (with turnaround experience)	n/a	□ Family ties among top managers increase consensus orientation, reducing ability to initiate change □ With informal management system is in place, ability to change is reduced (only firefighting) □ FF' long-term focus aids in adopting retrenchment strategies during turnaround
Hatum & Pettigrew, 2004	Qualitative	2 FF (edible oil industry), Argentina	n/a	□ Flexible firm has strong identity based in core values with previous generations □ Earlier professionalization helps building a more heterogeneous top team, less flexible firms relied on family members
Ceipek et al., 2021	Quantitative	46 CDAX firms, Germany (2002-2013)	n/a	□ Increased family influence leads to a negative impact on explorative behavior (in context of IoT)
Piezunka & Dahlander, 2015	Quantitative	922 firms with 105,127 crowd-sourced ideas, USA + Western Europe (2007-2011)	n/a	□ Organizations tend to filter out suggestions (through crowding, and content/structural distance) capturing distant knowledge □ Potential solution: network-based knowledge sourcing (opposite of crowd-based knowledge sourcing)
Hopp et al., 2018	Quantitative	1,078 journal articles (1975-2016)	n/a	□ Disruption as a complex concept involving individuals, groups, and organizations within wider economic and social systems (disruptive innovation (macro level) vs. radical innovation)
Herrero et al., 2022	Quantitative	131 fishing firms (93 FF), Spain (2013-2014)	n/a	□ Relationships outside of FF boundaries with family members increases performance □ Nonfamily connection for novel, non-redundant knowledge equally important
Jiang et al., 2021	Quantitative	18 refugees in host countries, (2016, 2020)	n/a	□ Entrepreneurs who think independently from their experience may be in a better position to create new and effective business models when they experience disruption
Brinkerink, 2018	Quantitative	346 manufacturing SME (FF and non-FF), Netherlands (2014)	Organizational Learning theory	□ FF have higher absorptive capacity for exploitative innovation, relying on long-term, deep relationships with external network □ FF are less conducive to exploratory innovation research
Jones et al., 2008	Quantitative	403 publicly traded firms (203 FF) (1994, 1998)	Relational view theory	□ Affiliate directors are more active in assisting FF than non-FF in pursuing growth strategies, particularly product diversification, by utilizing their experience, knowledge, and networks
Spriggs et al., 2013	Quantitative	199 small to midsize FF, USA	RBV, Agency theory	□ If Innovative capacity is high, firm performance is higher □ Small firms should prioritize innovative capacity in their network interactions instead of focusing on a collaborative network approach

Paper	Type	Sample	Theory	**Findings**
Cabrera-Suárez et al., 2011	Conceptual	n/a	RBV, Stake-holder theory	FF with high FSC are more likely to develop market-oriented culture through adaption of stewardship orientation (close relations and frequent interactions)

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4.3. Radical change implementation in family firms

While results of prior research is ambiguous, most extant studies display family firms more likely to focus on implementation of incremental rather than radical change (Nieto et al., 2015) (see Table 4). Yet depending on the resources and culture of family firms, they are just as likely as nonfamily firms, to achieve radical change (Covin et al., 2016; Wang et al., 2016), when displaying "high levels of proactiveness, networking, risk-taking, and financial resources support" (Covin et al., 2016, p. 5625). In the context of threatened socio-emotional wealth within a family, the likelihood of implementing radical change is increased, grounded in the significance of family firm continuity (Chrisman et al., 2015).

Family influences the firm's radical change adoption speed, intensity (Brinkerink et al., 2020; Kammerlander et al., 2018; Szewczyk et al., 2022), and aggressiveness (Kammerlander et al., 2018; Szewczyk et al., 2022). Family firms vary in their identity elasticity, which impacts the adoption speed and intensity of radical change implementation, (Brinkerink et al., 2020). Depending on the method of measurement, radical change adoption aggressiveness is either low (Brinkerink et al., 2020; Kammerlander et al., 2018) or high (Szewczyk et al., 2022). Additionally, the family innovator's dilemma results in lower adoption aggressiveness, as family firm managers prioritize current wealth over future wealth (König et al., 2013). When implementing radical change, family firms display more adoption stamina compared to nonfamily firms due to "patient capital" (König et al., 2013), and when possessing higher functional integrity, they are more inclined to allocate family income to radical change implementation in support of the family firm (Olson et al., 2003).

Family firms leverage their external network and internal social capital to turn external challenges into entrepreneurial opportunities (Salvato et al., 2020), leading to the implementation of radical change. Social capital (i.e., structural and relational) influences the adaptive capacity of family firms in dynamic environments, facilitating the recombination of resources for novel strategic initiatives (Salvato & Melin, 2008). In response to radical change, family firm managers exhibit heterogeneous reactions contingent upon their "social" capability (Shepherd et al., 2020). Resource and interpersonal transactions during stable times create resilience, which serve as a foundation when implementing radical change (Brewton et al., 2010).

Family firms face challenges when implementing radical change based on their specific network (Bendig et al., 2020; Chirico et al., 2022; Koka & Prescott, 2008). Prominent and entrepreneurial alliance networks[5] are negatively related to radical change implementation, as both network configurations are lacking required information to adjust efficiently (Koka & Prescott, 2008). Literature on the influence of family on innovation outcome is ambivalent, with some studies stating family involvement tends to be linked with a smaller number of innovations (Bendig et al., 2020), with an increased number of unrelated owner families hindering knowledge integration (Chirico et al., 2022) and ultimately impeding radical change implementation. Conversely, other literature suggests that family involvement can positively impact the number of innovations (Matzler et al., 2015) and enhance product innovation efficiency (Martínez-Alonso et al., 2022), likely fostering radical change implementation.

In the implementation of radical change in family firms, three supporting factors come into play, (1) strong vision (Mustakallio et al., 2002), (2) open culture (Hall et al., 2001), (3) supportive internal (Hall et al., 2001; Harryson et al., 2008; Vardaman et al., 2012) and external network (Bendig et al., 2020; Chirico et al., 2022). A strong vision among family members enhances strategic decision quality and commitment (Mustakallio et al., 2002) to radical change implementation. Culture plays a pivotal role in implementing radical change as an open culture with explicit values within a family firm can significantly enhance the level of learning (Hall et al., 2001). Moreover, the

5. Prominent alliance networks emphasize the advantages of accessing like-minded, established companies, while an entrepreneurial network position prioritizes bridging diverse information sources for uniqueness rather than redundancy (Koka & Prescott; 2008).

influence of networks on the implementation of radical change in family firms is contingent upon various contextual factors such as specifics like national culture, regulations, and further country-specific aspects (Sitthipongpanich & Polsiri, 2015), as well as the company's organizational structure, particularly its management setup (e.g., family vs. nonfamily CEO) (Chrisman et al., 2015; Vardaman et al., 2012).

Good interpersonal relations, within the family as well as between family members and employees, further support radical change implementation (Hall et al., 2001). Network centrality (i.e., strong network, mentoring, and sufficient information) supports employees to interpret change as controllable (Vardaman et al., 2012) and increases explorative innovation in learning alliances (Harryson et al., 2008). To foster communication during radical change implementation, medium strength boundaries between the family and the firm are key (Distelberg & Blow, 2011). External network connections are crucial, an increased number of unrelated families owning the company can contribute to higher levels of radical innovation with a strong commitment to change and knowledge integration (Chirico et al., 2022), and board members play a moderating role, attenuating the negative link between family involvement and the number or inventions (Bendig et al., 2020).

Table 4: Summarized findings on Output: Radical change implementation

Paper	Type	Sample	Theory	Findings
Salvato & Melin, 2008	Qualitative	4 FF in wine industry, Italy/ Switzerland	SC	□ SC (structural, relational) enables businesses to secure resources, engage in strategic collaborations, and foster trust with nonfamily partners, facilitating innovation (exploration) and effective use of existing resources (exploitation) □ Balancing exploration and exploitation can lead to long-term survival of FF
Bendig et al., 2020	Quantitative	1,85m patents from 258 S&P 500 firms, USA (2006-2013)	SC	□ Board members have a moderating role, attenuating the negative link between family involvement and the number or inventions
Salvato et al., 2020	Quantitative	180 firms (excl. banks, finance) surviving 2009 earthquake, Italy (2004-2013)	SC	□ Superior longevity of FF is largely due to their resilience, characterized by their capacity to absorb, react to, and benefit from challenges □ FF can turn adversities into entrepreneurial opportunities by exploiting their industry positioning and connections
Herrero & Hughes, 2019	Quantitative	163 FF (food manufacturing industry), Spain	FSC	□ Relational: ROE positively correlated with relational dimension of FSC; but negatively to family management □ Structural: Curvilinear inverted-U shape relationship with FF financial performance
Sanchez-Ruiz et al., 2019	Quantitative	845 and 646 FF, USA (2002, 2007)	FSC	□ High FSC (relational, cognitive) shows positive significance with nonfinancial internal outcomes but no significant effect on financial outcomes □ Indistinguishable FSC is positively associated with economic growth □ Low FSC almost indifferentiable to non-FF
Nieto et al., 2015	Quantitative	15,173 manufacturing firms (41% FF), Spain (1998-2007)	Agency theory	□ FF are less likely to achieve radical innovations but have high propensity to achieve incremental innovations □ FF are less inclined to turn to external sources, likely due to potential spill-over effects
Danes et al., 2009	Quantitative	533 small FF, follow-up of 311 FF, USA (1997, 2000)	SFBT	□ In short term, human and financial capital contributed more to success perception than FSC □ Long term FSC contributed more to success perception
Brewton et al., 2010	Quantitative	311 FF, USA (1997, 2000)	SFBT	□ Resource and interpersonal transactions during stability create resilience capacity, serving as foundation for addressing stresses during times of disruption (e.g., natural disaster) (Confirming SFBT)

Paper	Type	Sample	Theory	Findings
Olson et al., 2003	Quantitative	673 FF, USA (1997)	SFBT	In response to disruptions, families with higher functional integrity scores are likelier to allocate family income to address business cash flow issues than those with lower scores
Mustakallio et al., 2002	Quantitative	192 FF, Finland	Agency theory, Social theory of governance	FF adopt a relational governance approach, embedding SC in family and management relationships, with a strong shared vision among members enhancing strategic decision-making and commitment.
Covin et al., 2016	FsQCA	1671 FF and non-FF, DACH	Entrepre-neurial orientation theory	FF can be just as innovative as non-FF (in contrast to previous studies) High levels of proactiveness, networking, risk-taking, and financial resources support the output of innovation in general and radical innovation in particular
Distelberg & Blow, 2011	Mixed m.	492 interviews in 11 small to midsize FF, USA (2009)	Family Business Systems	The family system is key to communication with medium strength in boundaries (between family and firm) most beneficial When boundaries are diffuse create hierarchy among nonfamily employees
Chrisman et al., 2015	Conceptual	n/a	Four Cs	The relationship between degree of family command of a firm and adoption of discontinuous technologies is negative Relationship between the importance of FF continuity and the adoption of discontinuous technologies is positive
Szewczyk et al., 2022	Quantitative	75 e-commerce S&P 1500 firms, USA (1995-2019)	Four Cs	Manifest-based measure: family influence is linked to quicker but less aggressive adoption Language-based measure: family influence is linked to slower but more aggressive incumbent adaption
Harryson et al., 2008	Qualitative	120 interviews, Germany/Italy/Sweden/USA (2002-2006)	Inter-organizational knowledge transfer and networking	Volvo turned network knowledge (by formal and informal networking of employees) and disruptive technologies into innovation, using learning alliances to support explorative and exploitative innovation
König et al., 2013	Conceptual	n/a	n/a	Adoption aggressiveness is lower in FF due to family innovator's dilemma, and preference of current wealth over future wealth Family influence results in less open search and reduced adoption flexibility FF have more adoption stamina due to "patient capital"
Hu & Hughes, 2020	Literaturer-eview	51 papers	n/a	Until 2018 no literature review on radical change and FF Research gap: analysis on FF and radical innovation
Bövers & Hoon, 2021	Qualitative	1 FF (clothing industry), Germany	n/a	FF can draw on their past to address strategy-identity-inconsistencies, resulting from navigating rapid and disruptive change: 'Inventing history' is most effective
Wang et al., 2016	Quantitative	> 6,000 observations, China (2001-2010)	n/a	FF with political connections are more likely than non-FF to transform core business
Koka & Prescott, 2008	Quantitative	162 steel firms, globally (1980-1994)	n/a	If industry is undergoing radical change: both types of alliance networks are negatively related to performance (entrepreneurial vs. prominent)
Brinkerink et al., 2020	Conceptual	n/a	Organizational identity	Identity elasticity of FF drives timeliness (early vs. late) and nature (threat vs. opportunity) of interpretative frames Differences in framing are likely to influence speed and intensity

Paper	Type	Sample	Theory	Findings
Hall et al., 2001	Qualitative	2 case studies in FF, Sweden	Organizational learning theory	□ To encourage and foster a process of radical change, FF need to strive for explicit and open cultures □ Strong interpersonal relations are key
Chirico et al., 2022	Quantitative	236 FF, Spain	Organizational learning theory	□ Increased number of unrelated owning families negatively affect radical innovation in FF □ When commitment to change and knowledge integration are high, an increased number of unrelated owing families leads to higher level of radical innovation
Shepherd et al., 2020	Qualitative	110 interviews, Lebanon	Positive psychology, Positive organizational scholarship	□ 'Social' capability for resilience is created through activities building a basis for resilience
Vardaman et al., 2012	Quantitative	148 public school teachers, USA	Social network theory	□ Network centrality (incl. friendships) and self-efficacy are linked to interpreting change as controllable

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5. Discussion

In the scholarly discourse surrounding the influence of family firms' networks on radical change, a heterogenous narrative emerges. Research has shown that the networks within family firms are distinctively different from those of nonfamily firms, primarily characterized by their close-knit (Karlsson, 2018), homogenous ties (Lester & Cannella, 2006). This distinctive network configuration, coupled with the influence of familiness and social capital, fosters exploitative innovation and decreased external knowledge absorption (Brinkerink, 2018), thereby presenting challenges for radical change detection and implementation. However, literature also suggests that under certain conditions, such as specific network configurations and other factors (e.g., cultural context, inherent innovativeness, financial resources) family firms are at least equally capable of achieving radical change as their nonfamily counterparts (Covin et al., 2016). This nuanced understanding underscores the complexity of the relationship between family firms' networks and their capacity for radical change.

5.1. Opportunities for future research: Networks

Existing literature on networks describes their configuration and the interaction of family firms within their networks (e.g., Anderson et al., 2005; Carney, 2005; Hadjielias et al., 2022). Hence we know that family firms utilize close-knit (Karlsson, 2018), homogeneous networks (Lester & Cannella, 2006) that focus on control and longevity (Ciravegna et al., 2020). Paramount for future research is the investigation of how family firms reconcile the dichotomy between broad and closed networks, a decision that oscillates between capitalizing on established advantages and venturing into the acquisition of diverse, potentially transformative knowledge (Brinkerink, 2018). Research should also consider under which conditions family firms are able to restructure their networks for long-term success (incl. radical change adoption). Moreover, further research is required to explore how family firms can modify their network structure and related behavior to enhance bridging social capital, which is critical for accessing external resources (Uhlaner et al., 2015) (see Figure 2).

> *RQ1. How can family firms optimize their network set-up for radical change, leveraging exploitation and exploration?*

Additionally, the cultural dimensions underpinning networking strategies, particularly the interplay between individualism and collectivism, emerge as a critical area of inquiry. Such exploration is expected to shed light on how social capital is influenced by varying cultural contexts across different geographical landscapes (e.g., Sitthipongpanich & Polsiri, 2015). It is very likely that industries, cultural background, and country affect family firms' networks, influencing radical change, depending on the context in which the firm is established. Understanding these factors can provide valuable insights and reveal patterns and strategies that might be unique to specific regions. Such comprehensive analysis can help understand the diverse ways family firms navigate and leverage their unique positions within their respective cultural and industrial environments.

RQ2. How do cultural and industry contexts influence the networking strategies of family firms during periods of radical change?

Equally important is the examination of the management dynamics in family firms undergoing radical change, specifically contrasting the networking approaches of family versus nonfamily managers. Here, the focus should be on discerning whether nonfamily managers in family firms utilize their networks distinctively and how such utilization affects radical change adoption and implementation. Moreover, the managers' diverse professional backgrounds prior to their tenure in the family firm as well as the personality traits of these managers, ranging from extroversion to introversion, should be investigated as potential significant determinants of these networks and their subsequent impact on the firm's adaptability to radical changes.

RQ3. How do the personality traits, professional experiences, and backgrounds of family and nonfamily managers affect the network dynamics of family firms during radical change?

5.2. Opportunities for future research: Radical change detection

Current literature pertaining to the detection of radical changes within family firm networks predominantly focuses on innovation-related themes (e.g., Brinkerink, 2018; Kumaraswamy et al., 2018; Trantopoulos et al., 2017), with a particular emphasis on the pivotal role of entrepreneurial culture (e.g., de Groote et al., 2021; Jiang et al., 2021; Zahra et al., 2004). Upon synthesizing these articles, a discernible narrative emerges, highlighting the imperative for family firms to foster innovation for the detection of radical change. Yet, there is a need to explore under which conditions an innovative culture within a family firm leads to early vs. late detection of radical change (Chirico et al., 2022), thus enabling the firm to respond more effectively to radical change. Additionally, future research should examine if and how the configuration and behavior of family firm networks, underpinned by an innovative culture, leads to early detection of radical change. Current literature displays family firms' unique challenges including the prevailing influence of family impeding the introduction of external perspectives (Carnes & Ireland, 2013; Chirico & Salvato, 2016). Moreover, the dual nature of family social capital can either foster (Sherlock et al., 2023) or limit innovation (Herrero, 2018), depending on the social capital configuration (Herrero & Hughes, 2019). Yet, literature has not yet presented any optimum network configuration and recommended behavior for early radical change detection.

RQ4. How can family firms leverage social capital to improve their network configuration, fostering an innovative culture to detect radical change early?

One important aspect for future research is to understand the detailed process of detecting radical change in family firms, with focus on the role of networks. This involves delving into the mechanisms through which family firms leverage their unique network structures to recognize and act upon opportunities for radical change. It is crucial to examine how family firms interpret and make sense of change—both initially and over time—especially when such insights are derived from their networks. This inquiry will shed light on the sense making processes within family firms as they navigate the emergence of radical change. Furthermore, future research should aim to pinpoint the types of relationships that best facilitate responsiveness and adaptability to radical change within family firms. Such research should build upon patterns such as external orientation (Herrero et al., 2022; Nason et al., 2019; Spriggs et al., 2013; Zahra et al., 2004), unprecedented views (Jiang et al., 2021; Nason et al., 2019), and long-term orientation (Cater & Schwab, 2008; Hanson et al., 2019), encouraging exploratory innovation (Spriggs et al., 2013) and openness to diverse knowledge sources (Herrero et al., 2022). These factors potentially enhance the detection of radical change.

RQ5. How the process of family does firms detecting radical change based on their networks look like, and how can they leverage their networks to detect and interpret radical change?

5.3. Opportunities for future research: Radical change implementation

Literature pertaining to the implementation of radical change is centered around three themes: likeliness of achieving radical change (e.g., Nieto et al., 2015; Covin et al., 2016; Wang et al., 2016), the influence of family on the implementation of radical change (e.g., Kammerlander et al., 2018; Szewczyk et al., 2022; Brinkerink et al., 2020), and family firms' capacity for resilience (e.g., Shepherd et al., 2020; Brewton et al., 2010). In family firms, the implementation of change varies significantly, with a spectrum ranging from incremental (Nieto et al., 2015) to radical innovation depending on resources and culture (Covin et al., 2016; Wang et al., 2016). A key area for investigation is the specific challenges encountered by family firms during the implementation of radical changes, particularly in relation to their internal and external network ties. Hence, future inquiry should aim to discern which network ties are beneficial and resource-providing during the implementation phase, and which ones function as impediments.

> *RQ6. How do different network ties benefit or distract family firms from their goals when implementing radical change?*

Furthermore, it is essential to explore if and which adjustments in the external and internal network ties of family firms are necessary for successful radical change implementation. Current research suggests that supportive internal (Hall et al., 2001; Harryson et al., 2008; Vardaman et al., 2012) and external networks (Bendig et al., 2020; Chirico et al., 2022), good interpersonal relations (Hall et al., 2001), and strategic network centrality for employees (Vardaman et al., 2012) are crucial for successful radical change implementation, without specifying the process of family firms collaborating with network ties. With resilience acting as a cornerstone during the encounter with radical change (Brewton et al., 2010), there is an intriguing possibility of applying the Sustainable Family Business Theory to the context of radical change implementation in family firms. Investigating the applicability of this theory could provide valuable insights into the resilience and adaptability of family firms in face of radical changes.

> *RQ7. How can family firms create resilience and adaptability when undergoing radical change?*

Figure 2: Identified research gaps and future opportunities

	Networks	Radical change detection	Radical change implementation
Research gap	• Optimum between broad and closed networks of family firms, capitalizing on established advantages and acquiring diverse, potentially transformative knowledge • Conditions required for family firms to have the capability to restructure their networks for long-term success • Modification of family firm network structure and related behavior to enhance bridging social capital, to access external resources • Factors influencing cultural dimensions within social capital underpinning networking strategies, particularly the interplay between individualism and collectivism	• Factors influencing innovative culture within family firm leading lead to early versus late detection of radical change • Configuration and behavior of family firm networks, supported by an innovative culture, leading to the early detection of radical change • Identification of optimum network configuration and recommended behaviors for the early detection of radical change in family firms • Detailed process of detecting radical change in family firms, with a focus on the role of networks, including the mechanisms through which family firms leverage their unique network structures	• Challenges faced by family firms during the implementation of radical changes are influenced by their internal and external network ties, including beneficial and disadvantageous ties • Applicability of the Sustainable Family Business Theory, previously associated with natural disaster response, to understand the resilience and adaptability of family firms facing radical change
Future research oppor-tunities	• How can family firms optimize their network set-up for radical change, leveraging exploitation and exploration? (RQ1) • How do cultural and industry contexts influence the networking strategies of family firms during periods of radical change? (RQ2) • How do the personality traits, professional experiences, and backgrounds of family and non-family managers affect the network dynamics of family firms during radical change? (RQ3)	• How can family firms leverage social capital to improve their network configuration, fostering an innovative culture to detect radical change early? (RQ4) • How does the process of family firms detecting radical change based on their networks look like, and how can they leverage their networks to detect and interpret radical change? (RQ5)	• How do different network ties benefit or distract family firms from their goals when implementing radical change? (RQ6) • How can family firms create resilience and adaptability when undergoing radical change? (RQ7)

5.4. Contributions

This literature review makes two pivotal contributions to research on the intersection of family firms, network analysis, and radical change. Firstly, the review links and synthesizes existing literature knowledge across the three fields, integrating diverse strands along the IPO framework. The literature review enhances current literature reviews, by not only exploring the impact of family firms and radical innovation (i.e., Hu & Hughes, 2020) and family firms and social capital (i.e., Stasa & Machek, 2022) on radical change, but also addresses how family firms' reliance on close-knit networks (Karlsson, 2018) affects their ability to detect and implement radical change. This synthesis provides a holistic view of the current state of literature, highlighting the complex interplay between family firms, their networks, and their ability and willingness to detect and implement radical change.

Secondly, the literature review sheds lights on future research avenues, proposing scholarly investigations into the dynamics of these relationships and suggesting a need for more in-depth studies, particularly on understanding how family firm networks influence the strategic decisions about and adaptation to radical change. Notably, it draws attention to the lack in literature that comprehensively addresses all three fields of 'family firm,' 'network,' and 'radical change' simultaneously, with currently only two papers explicitly focusing on this nexus. The first of these two articles, authored by Brewton et al. (2010), centers on the implications of natural disasters in family firms, thereby focusing on a niche within the broader discourse of radical change. The second article, authored by Zahra (2010), delves into the influence of organizational social capital, specifically in the context of firms' investments in new ventures. This gap signals a crucial area for future research, suggesting the need for more in-depth studies that explore these interconnections. Understanding these dynamics is also essential for developing more effective strategies for family firms facing radical change. The research gap is evident in instances where radical change is used in the context of natural disasters (i.e., Brewton et al., 2010) or emerging economies (i.e., Hatum & Pettigrew, 2004), rather than being systematically explored in the context of the significant reconfiguration of resources (Stopford & Baden-Fuller, 1994). Notably, scholarly attention has been more profoundly directed towards the exploration of family firm networks in comparison to the investigation of family firms navigating through phases of radical change. Consequently, the treatment of the topic on radical change in conjunction with family firms, and networks remains underdeveloped, with a noticeable deficiency of comprehensive and integrated research within the literature.

5.5. Practical implications

With family firms facing ongoing economic and strategic challenges, this literature review provides three practical implications by outlining the unique network configurations and behaviors to navigate the opportunities and challenges associated with radical change. Firstly, family firms need to recognize the advantages and limitations of closed networks in family firms. It is crucial to leverage close-knit, homogeneous networks to foster exploitative innovation while acknowledging the limitations of external knowledge absorption. Secondly, family firms should encourage and implement exploratory innovation practices, by opening their network, to identify and adapt to radical changes early. Lastly, family firms need to fully commit to radical change and cultivate a supportive culture that empowers employees to embrace and drive radical change. The literature review helps family firms to recognize the necessity of improving their network configuration to foster innovativeness, thereby enhancing the ability to detect and implement radical changes effectively. Recognizing the conditions under which family firms can achieve radical change similar to nonfamily firms provides actionable insights for enhancing adaptability and resilience. Ultimately, this literature review equips practitioners with a nuanced understanding of how to strategically manage networks within family firms to drive radical change.

5.6. Limitations

This literature review is subject to several limitations that merit acknowledgment. Firstly, the scope of this review was confined to papers published in English language, thereby excluding potentially relevant studies conducted in other languages. Additionally, the review did not encompass books and other forms of literature, only focusing on selected, high-quality journals. The actual number of papers and research efforts in this specific area is limited. This scarcity of dedicated research has led to a reliance on studies with varying focuses and relying on various concepts related to the core topic at hand; they focused, for instance on adopting exploratory innovations. Consequently, this diversity in study focus somewhat dilutes the specificity and applicability of the findings to the precise intersection of family firms, their networks, and radical change. The vast array of related concepts in the three fields also presents a limitation, as it was not feasible to include every single concept related to the topic. Another notable limitation lies in the temporal context of the studies reviewed. The role of networks in the context explored, particularly since the 1990s, may have evolved, and this review does not account for such potential changes over time. Moreover, cultural and regional differences have not been extensively explored in the existing literature, which limits the generalizability of the findings across different contexts and types of family firms. Depending on the individualism vs. collectivism level in a culture, network support might be more or less available and useful. Further, one could imagine that large families might require different processes and structures to successfully incorporate the input of networks as compared to business owned and managed by one or few individuals. Moreover, it is likely that 'next gen members' who are socialized in a more open, globalized, and digitalized world, will have different network ties as compared to older generations and might also use them differently for radical change detection and implementation. Furthermore, the literature review is limited in its theoretical analysis, having examined only the five most prominent theories. This narrow focus may overlook other relevant theoretical frameworks, potentially also from other disciplines such as sociology or psychology, that could provide additional insights into the complex interplay between family firms, networks, and radical change. These limitations highlight additional areas for future research and underscore the need for a broader, more inclusive approach in subsequent studies.

5.7. Conclusion

In conclusion, this literature review explores firms' networks and their substantial influence on both the detection and implementation of radical change in family firms. Through a synthesis of existing literature, it sheds light on how these firms' unique network configurations and behaviors critically shape the detection and implementation of radical change. This paper addresses a notable gap in existing research by cohesively linking the three interrelated fields of family firms, networks, and radical change. The literature review utilizes the Input-Process-Output framework, synthesizing theory, and content-related findings, while setting a clear research agenda. This agenda articulates specific, actionable research questions that pave the way for future scholarly exploration. The review underscores the complexity of the influence of networks on family firms facing radical change and highlights the need for further empirical investigation to deepen our understanding of these interactions and their impact on firm transformation.

Author contribution statement

The authors contributed equally to the work.

Conflict of interest statement

The authors declare that they have no conflicts of interest.

Ethical statement

The authors declare that all ethical standards, as noted by DFG ("Guidelines for Safeguarding Good Research Practice") have been adhered to.

Declaration on the use of generative AI in the writing process

The authors declare that generative AI was not used in the research and writing process

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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