COMILLAS
UNIVERSIDAD PONTIFICIA

FACULTY OF ECONOMICS AND BUSINESS
ADMINISTRATION (ICADE)

Leader Traits and Emotions in the Wild Ride of Breaking Barriers to Sustainability through Eco-Innovation and Circular Economy in SMEs

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MADRID | November 2024

Acknowledgments

I want to thank my supervisors, Prof. Angela Triguero Cano and Prof. Marta de la Cuesta González, for all their generosity and dedication throughout this PhD process. I feel truly fortunate that they have accompanied me on this long journey. Their intelligence and years of academic experience have made the learning process even more enjoyable and fruitful. I have felt that they have not only guided me from a technical point of view but also from a more human point of view, always with a loving, positive and at the same time realistic attitude.

Thanks to my parents, Teresa and Ángel. For their love of work, for taking care of the intellectual and emotional aspects of life, and for transmitting the value of applying effort in a positive way. Thanks to my sister Lucia for always listening to me. Also, to the rest of the family, my aunt Nena always takes an interest in how I am doing and to all my friends who have accompanied me, I feel very fortunate to have them; their support has been essential to know that I was not alone. Finally, I would like to thank my sons, Diego and Pablo, for being there and my husband, Pedro, who has made everything easier. His listening, patience and calmness have allowed me to dedicate more time to my PhD.

I would also like to thank all my colleagues in the Cetis programme, especially my classmates, who could not have been better colleagues along the way, intelligent and generous in equal measure: Andrés Camacho, Grace Akullo, Eva Agrulla, Diego Loras and Gerardo Gómez. Also, to my fellow guides for their inspiration and continuous availability: Maria Jose Manjón, Arancha Larrañaga and Marisa Hernández. I would also like to thank all the Cetis teachers who have understood a little about the craft of research and appreciate all the hours that go into it: Amparo Merino, Paolo Saona and Isabel Carrero. Mamen Valor, especially, for her dedication and generosity, coherence, and great humanity. Also, to a person who has accompanied me discreetly throughout this PhD process, Kirsty Brown.

Finally, we thank the 40 leaders I interviewed who trusted our research. They were honest, and despite more intimate questions than a simple questionnaire, they showed up and committed themselves to our proposal. All of them are passionate about their work in the company, committed to new ways of doing business, and more socially and environmentally conscious. We wish them all the greatest success.

Abstract

Despite the scientific community's warnings regarding the need for a change to a more responsible production model towards the planet, sustainability continues to be an important challenge for companies, especially for small and medium-sized companies (SMEs). For this reason, this thesis focuses on studying the behaviour and characteristics of the people who lead SMEs who have opted for such a transition. The achievement of this objective has allowed us to carry out an in-depth review of the theoretical approaches used to date to study the behaviour of these SME leaders concerning eco-innovation, circular economy and sustainability; to study the combinations of personality traits that facilitate the overcoming of barriers in the adoption of eco-innovations; and, finally, to the emotions experienced by these leaders and their response when faced with various obstacles that prevent the adoption of more sustainable, circular and eco-innovative business models.

This thesis allows us to delimit the most appropriate theoretical framework to analyse the behaviour of SME leaders to face to sustainability challenge after carrying a systematic literature review of research about sustainability, circular economy and eco-innovation topics following the PRISMA method. After using information from 40 in-depth interviews carried to innovative and circular economy-oriented SMEs, it is shown that SME leaders with specific personality traits, such as agreeableness, openness and conscientiousness, perceive and interpret barriers differently to leaders who exhibit other traits. These results show the need to consider different leader personality traits in the study of barriers to eco-innovation. Moreover, it contributes to support the relevance of sensemaking theory to assess potential barriers to eco-innovation and the use of Qualitative Comparative Analysis (QCA) as a more suitable methodology to identify these leader personalities based on configurational theory. Finally, it is explored how emotions influence the behaviour of 17 SME leaders in the context of CE through a hermeneutic phenomenological study. It identifies three coping strategies: "inspiration," "deliberation," and no strategy. It is highlighted the role of emotions like anger, frustration, fear, and powerlessness in overcoming barriers to CE adoption. It shows that different leaders experience varied emotions in response to the same barriers, impacting their coping strategies.

The practical implications of this thesis are beneficial for firms, governments, institutions and people committed to achieving sustainable growth. Our findings are valuable for the training of sustainable entrepreneurs and to design tools to reduce the obstacles they face. It also enables these entrepreneurs to have a better understanding and knowledge of the influence of their personality traits and the emotions they experience and how they react to these obstacles. The findings also offer valuable insights for both theory and practice, emphasizing the importance of emotional responses in sustainable business practices. Thus, the planning and implementation of sustainable practices (eco-innovations) can be improved and made more efficient, contributing to the creation of an environment that favours sustainability and the transition to a more circular economy.

KEYWORDS: *leader, sustainability, circular economy, eco-innovation, barrier, microfoundation, SME*

Resumen

Pese a las advertencias de la comunidad científica respecto a la necesidad de un cambio hacia un modelo de producción más respetuoso con el planeta, la sostenibilidad sigue siendo un desafío importante para las empresas, y, en especial para las pymes. Por ello, esta tesis se centra en el estudio del comportamiento y las características de las personas que lideran pequeñas y medianas empresas que han apostado por dicha transición. Para alcanzar este objetivo, se ha realizado una profunda revisión de los enfoques teóricos utilizados hasta la fecha para estudiar el comportamiento de estos líderes de pymes respecto a la eco-innovación, la economía circular y la sostenibilidad; se han identificado las combinaciones de rasgos de personalidad que facilitan la superación de barreras en la adopción de eco-innovaciones; y, por último, se han estudiado las emociones que experimentan estos líderes y su respuesta cuando se enfrentan a diversos obstáculos que impiden la adopción de modelos de negocio más sostenibles, circulares y eco-innovadores.

De este modo, esta tesis ha permitido delimitar cuál es el marco teórico más apropiado para analizar el comportamiento de los líderes de estas pymes tras realizar una revisión sistemática de la literatura relacionada con sostenibilidad, economía circular y eco-innovación siguiendo el método PRISMA. Además, utilizando la información de 40 entrevistas en profundidad realizadas a pymes innovadoras y muy proactivas en economía circular, se ha identificado que los líderes que se caracterizan por rasgos de personalidad como la amabilidad, la apertura y la responsabilidad interpretan las barreras de manera diferente a los líderes que tienen otros rasgos. Dicha evidencia ha demostrado la necesidad de considerar diferentes rasgos de personalidad del líder en el estudio de las barreras a la eco-innovación. Asimismo, los resultados obtenidos muestran la utilidad de la teoría del *sensemaking* para estudiar las barreras a la eco-innovación y del Análisis Cualitativo Comparativo (QCA) como la metodología más adecuada para identificar las personalidades de estos líderes a partir de la teoría configuracional. Finalmente, se explora cómo las emociones influyen en el comportamiento de 17 líderes de PYMES en el contexto de la Economía Circular (EC) a través de un estudio fenomenológico hermenéutico. Se identifican tres estrategias de afrontamiento: "inspiración", "deliberación" y ninguna estrategia. De este modo, se destaca el papel de emociones como la ira, la frustración, el miedo y la impotencia en la superación de barreras para la adopción de la EC mostrando como los líderes experimentan diferentes emociones en respuesta a las mismas barreras, lo influyendo en sus estrategias de afrontamiento.

Las implicaciones prácticas de esta tesis pueden ser beneficiosas para las empresas, los gobiernos, las instituciones y las personas comprometidas con la consecución de un crecimiento sostenible. La evidencia obtenida es de interés para la capacitación de emprendedores sostenibles y en el diseño de instrumentos que permitan disminuir los obstáculos a los que se enfrentan. Igualmente, también permite que dichos emprendedores tengan una mayor comprensión y conocimiento respecto a cómo influyen en este proceso sus características personales, las emociones que experimentan y cómo reaccionan ante dichos obstáculos. Los hallazgos también permiten destacar la importancia de las respuestas emocionales en las prácticas empresariales sostenibles desde el punto de vista teórico y empírico. Asimismo, ello puede permitir mejorar la planificación y ejecución de prácticas

sostenibles (eco-innovaciones) de forma más eficiente y contribuir a crear un entorno que favorezca la sostenibilidad y el tránsito hacia una economía más circular.

PALABRAS CLAVE: *líder, sostenibilidad, economía circular, eco-innovación, barrera, microfoundation, pyme*

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A format and style note, including published works in this thesis, adds complexity to the overall format of the document. The regulations of Universidad de Comillas require that when publications are incorporated into a thesis, elements such as font type, size, heading styles, page layout, pagination, and reference formatting remain consistent throughout the document. Although the presentation of the publications differs in these aspects from their original published version, the text and structure have been preserved unchanged. This thesis includes the British spelling used in the articles. For ease of reading, reference lists have been moved and consolidated at the end of the thesis. Tables and figures have been renumbered to correspond to the thesis as a whole rather than the individual publications.

This thesis utilised artificial intelligence (ChatGPT) for proofreading purposes.

Introduction

"We need to engage with practice to identify, develop, and empower heroic leaders, because the issue is urgent, and the future is now"
(Walls et al., 2021, p. 11)

The journey toward sustainability poses a fundamental common challenge because science warns us of the concept of planetary boundaries[1]. These are a set of nine planetary boundaries within which humanity must keep to achieve development and prosperity for generations to come. However, six of these nine boundaries have been breached (Richardson et al., 2023) (as a dramatic sample the recent Spanish flooding has made climate change tragically visible). Moreover, if we add the Ukrainian-Russian and Israeli-Palestinian wars to the world situation, we need to talk about the existence of a significant global social and environmental crisis. Since some years ago, the Council for Sustainable Development, a forum of 200 companies, including some of the world's best-known brands and multinational enterprises (MNEs) is considering the planetary boundaries framework to shape its strategies. The latter has led to increase the companies' commitment to sustainability (Rockström et al., 2009; Steffen et al., 2015). However, a better understanding of the drivers and actors (individuals and enterprises) that make this transition possible is needed to avoid that more people and countries will be affected by environmental and social problems in the following years. In this regard, neither large corporations nor political organizations at the local, national or supranational levels are sufficient to tackle the significant challenges posed by this change. Without small and medium-sized enterprises (SMEs), which constitute the majority of businesses, and the individuals who lead them—those heroic leaders referenced by Walls in her quote—it is not possible. Indeed, this thesis focuses on this group of individuals and this type of enterprise.

The purpose of this introduction is to present the context and motivation for the research, the research aims and questions, the epistemology and methodology approach and provides an overview of the thesis structure and, the publications and outreach.

1. Context and Motivation for the Research

Sustainability in Small and Medium Enterprises (SMEs)

The thesis begins with a very evident fact: SMEs implementing sustainability face many obstacles (Rizos et al., 2016). In many cases, overcoming these setbacks depends on the determination of the leader driving the initiatives forward (Bossle et al., 2016; Burki et al.,

[1] The update to the planetary boundaries' framework reveals that six of the nine boundaries have been breached, indicating that Earth is currently outside the safe operating space for humanity: Climate Change, Biodiversity Loss, Land-Use Change, Biogeochemical Cycles (Nitrogen and Phosphorus), Chemical Pollution and Freshwater Change. Ocean acidification is nearing its threshold. Stratospheric ozone levels have seen a slight recovery. Atmospheric aerosol loading was crossed in the 1990s, but we are now back to a safe place thanks to banning most substances that were damaging this protective layer of the atmosphere.

2019; El-Kassar & Singh, 2019; Jun et al., 2021). In the fields of business and sustainability, it is surprising to see a broad literature exploring sustainable consumer behaviour (Larranaga & Valor, 2022; Valor et al., 2018), but, unfortunately, we know very little about the individual characteristics of a sustainable SME leader. Sustainable SMEs are companies that adopt practices that minimise their environmental impact without compromising profitability. They comply with environmental regulations and make proactive decisions to reduce their ecological footprint through efficiency and innovation. They balance their social and environmental impact (Revell & Blackburn, 2007; Spence & Rutherfoord, 2003). Sustainable SME leaders, in most cases, have limited time to give information on surveys or in forums where their concerns or demands could be collected (Walls et al., 2021). Furthermore, when there is available information from this type of enterprise, the number of such SMEs needs to be higher to provide a viable sample to be analysed.

The role played by SMEs in sustainability is essential. SMEs, in most countries defined as organizations with less than 250 employees (OECD, 2005). They are the backbone of any economy around the world, regardless of their location. In OECD member countries, SMEs comprise 95% of firms with employees and employ more than 60% of the total workforce (OECD, 2017). Regarding the impacts generated by SMEs, they are vital actors in achieving sustainable development, as they represent 64% of the global environmental impact in the EU (Bakos et al., 2020; Calogirou et al., 2010). Given the economic importance of SMEs and their impact on social and environmental issues, without their participation and commitment, it will be very difficult to activate sustainable development and the achievement of the Sustainable Development Goals (European Commission, 2020; Pimenova & Van Der Vorst, 2004).

This thesis will focus only on SMEs because these types of companies are different from large companies when it comes to adopt their sustainability strategy: (1) SMEs have more obstacles when seeking financing, mainly due to the high risk perceived by financial institutions due to their assets availability and economic downturns in adverse market conditions (Ahmadov et al., 2023, Murillo-Luna, 2011; Rizos et al., 2016). (2) Large companies have an easier time achieving sustainability because they have more resources, such as capital, knowledge and technology (Bakos et al., 2020). (3) SMEs suffer a lack of support from their supply and demand network to become greener which makes it difficult to improve their supply chain through sustainable suppliers and convince potential green consumers of products and services (Rizos et al., 2016; Ukko et al., 2022). (4) SMEs, being more flexible and agile, have an easier time overcoming barriers; for example, a changing market or the bureaucratic management of environmental and social issues (Passaro et al., 2023). (5) The smaller the organization, the closer the decision-makers are to their customers and other stakeholders (Eggers et al., 2012). This closeness, in turn, can provide them with valuable market intelligence when reacting to crises or big challenges such as climate change.

Corporate Sustainability (CS), Circular Economy (CE) and Eco-Innovation (EI)

Since Brundtland Commission states the most accepted definition of sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987), the term "sustainability" is related to the balanced and systemic integration of intra and intergenerational economic, social, and environmental performance. Based on this definition, CS includes corporate activities that proactively seek to contribute to economic, environmental, and social sustainability at short and long run by firms. Thus, the so-called triple bottom line approach arises to balancing economic, social, and environmental performance at the firm level. CS literature considers four dimensions of sustainability: economic, social, environmental, and temporal. In this regard, it is needed to integrate sustainability into core business strategies to ensure long-term viability and firms' competitiveness (Amini & Bienstock, 2014). Moreover, the concept of temporal sustainability is also very important because the long-term impacts of sustainable practices must be guaranteed to multiple stakeholders now and in the future (Amini & Bienstock, 2014; Lozano, 2015).

From a holistic view, CS ''is the capacity to survive through ensuring the economic, financial, environmental, and human facets. Without innovation, the company loses competitive advantage. Without economic balance, the company also loses. Without environmental sustainability, there are no conditions to survive'' (Rego et al., 2017, p. 142). Although initially the main concern was about environmental degradation, all three dimensions have equal weight. However, it is true that the environmental dimension has recovered greater relevance within the CS strategy in recent years, as shown by the close relationship between with CE.

Environmental sustainability implies the implementation of sustainable practices and a change of management of natural resources. In this sense, CE emerges as a new paradigm for sustainable development. CE is "a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling" (Geissdoerfer et al., 2017, p. 759). Hence, circularity is a condition of sustainability (conditional relationship) and is one of possible pathways to achieve sustainability (beneficial relationship) (Geissdoerfer et al., 2017). Moreover, the implementation of more sustainable solutions requires the access of technological knowledge and innovations with environmental benefits: EIs. In this vein, "EI is crucial for creating synergies between sustainability and competitiveness towards a green economy" (Mazzanti, 2018, p.1853), upholding also the idea that EI and CS are linked when implementing sustainability in an organization (Fortunati et al., 2020; Paraschiv et al., 2012).

Effectively, the complementary relationship between CS and CE has been recognised extensively in the literature (Nikolaou & Tsagarakis, 2021; Santos et al., 2017), but they are not completely interchangeable. CS is a flexible paradigm that allows companies to adopt a broad range of institutional commitments to be sustainable, but the boundaries of this strategy are blurred, and it is sometimes difficult to see whether or not it is close to circularity (Geissdoerfer et al., 2017; Khan et al., 2020; Urbinati et al., 2017). On one hand, CE is a narrower framework and, at the same time, clearer than CS when implemented by

firms. Moreover, CE approach often highlights environmental and economic benefits but forget social dimension (Barford & Ahmad, 2021 Geissdoerfer et al., 2017). Although it is true that an excessive focus on circularity can neglect other sustainability dimensions resulting in a potential trade-off between CE and CS, the overlaps between the two concepts are important. Most of circular business models integrate the principles of sustainable development and the CE principles (Bocken et al., 2018). In addition, technological solutions as EI appears as the most suitable tool to integrate CE principles and increase CS.

"EI is defined as a set of technological and non-technological innovations that prevent and enable the recovery of environmental damage" (De Jesus et al., 2019, p. 3014), but it is recognised that not all EI are adopted under CE principles and are compatible with CE (De Jesus et al., 2019; Ghisetti & Montresor, 2019; Kiefer et al., 2024). Despite there is a growing number of studies that state the close link between EI and CE (De Jesus & Mendonça, 2018; Prieto-Sandoval et al., 2018), the connection of these two concepts is not always unequivocal. EI is considered a tool or an instrument for the CE (De Jesus & Mendonça, 2018; Kiefer et al., 2024). Effectively, EI is a facilitator of the CE and help to achieve CE, but this happens if this transformation process requires service innovations and novel organisational set-ups and be based on cooperation and multi-actor "systemic" integration (De Jesus et al., 2019). This implies that technological EIs are a pre-requisite to CE success but the consequences in environmental and economic terms will depend on the type (i.e., eco-design, eco-process) (Demirel & Danisman, 2019). According to Kiefer et al. (2024), CE can be achieved quickly with radical innovations and more slowly with many incremental and accumulated innovations. This idea is consistent with other scholars that argue that managers in redirecting innovation activities from "eco-efficiency" toward "eco-effectiveness" for easing and underpinning the transition to a functional CE, eventually resulting in more sustainable and resilient economic systems" (Schultz & Reinhardt, 2022, p. 1662). Regardless of the object, EI enables the firms to move closer to the CE.

To achieve a CE, firms need to develop and adopt EI (Ghisellini et al., 2016). This highlights the importance of EI to needed challenges to initiate transition to CE and implement a CS strategy compatible with CE principles. EI is crucial to the paradigm shift towards CE but not all EI are circular because they must be guided by CE principles involving practices such as disconnecting from raw materials, repurposing waste in different processes, and introducing service and organizational innovations (Antonioli et al., 2022; De Jesus & Mendonça, 2018). Therefore, in the Chapter 2 and 3, we do not focus on either CS, CE or EI because we understand that these concepts are interrelated. Consequently, we focus on the characteristics of leaders who advocate for the transition to CE, either through CS strategies compatible with CE principles or the adoption of circular EI.

Search and Selection Process for the Sample of Spanish SMEs in the Thesis

The process of selecting, contacting, and interviewing the sample of Spanish SMEs was lengthy and demanding, beginning in October 2021, and concluding in April 2022. The SMEs were initially sourced from two lists of innovative and circular economy-oriented SMEs provided by two Spanish institutions: the *Alto Comisionado para España Nación Emprendedora*, a government agency under the Office of the President, and ENISA (*Empresa*

Nacional de Innovación), which supports viable companies with a focus on fostering innovative entrepreneurship. ENISA operates under the Ministry of Industry. From this initial list, we verified that the SMEs had some familiarity with sustainability, even if they had not fully implemented it. Additionally, we aimed to ensure representation from across Spain. The selected SMEs also had to meet specific criteria regarding employee count and years of operation, detailed in Chapter 2 below. We then reached out to the leaders of these companies to distribute the questionnaires and schedule follow-up interviews. Initial contact was made via email, LinkedIn messages, or, if direct contact was unavailable, through the corresponding *Cámara de Comercio*.

Thanks to the help of FINRES (Research Group UNED's Sustainable Finance and Social Responsibility) and Ministerio de Trabajo y Economía Social, 2021 as funding entity, we were able to set up an institutional email address for this research group. Although the invitation was sent from this institutional email, which we believed would facilitate a quicker and more efficient response, some recipients declined to participate or did not respond. In some instances, we had to pursue the respondents persistently until they provided a date and time for the interview. Upon inviting the leaders, the purpose of the research was explained, and they signed an informed consent form guaranteeing confidentiality and the author's anonymity. The interviews started by addressing any potential questions about the questionnaire sent beforehand and followed by an open and dynamic interview conducted in a conversational style, using open-ended questions focused on the leaders' experiences, as required by an inductive phenomenological approach (Laverty, 2003). After considerable effort, we ultimately secured a final sample of 40 SMEs representing all *Comunidades Autónomas* except the *Canarias and Islas Baleares*. This sample was used for the study presented in Chapter 2.

Several of these 40 SMEs were selected to carry out the qualitative phenomenological study, Chapter 3. The selected SMEs were selected based on whether they were moving towards the CE and adopting EIs. In other words, they were at the intersection shown in Figure 1. This sampling approach to select a relatively homogeneous sample has been considered adequate (Suri, 2011) to provide an in-depth understanding of the phenomenon to be studied, in this case, emotions towards CE and EI barriers. This methodology reached saturation after 17 interviews.

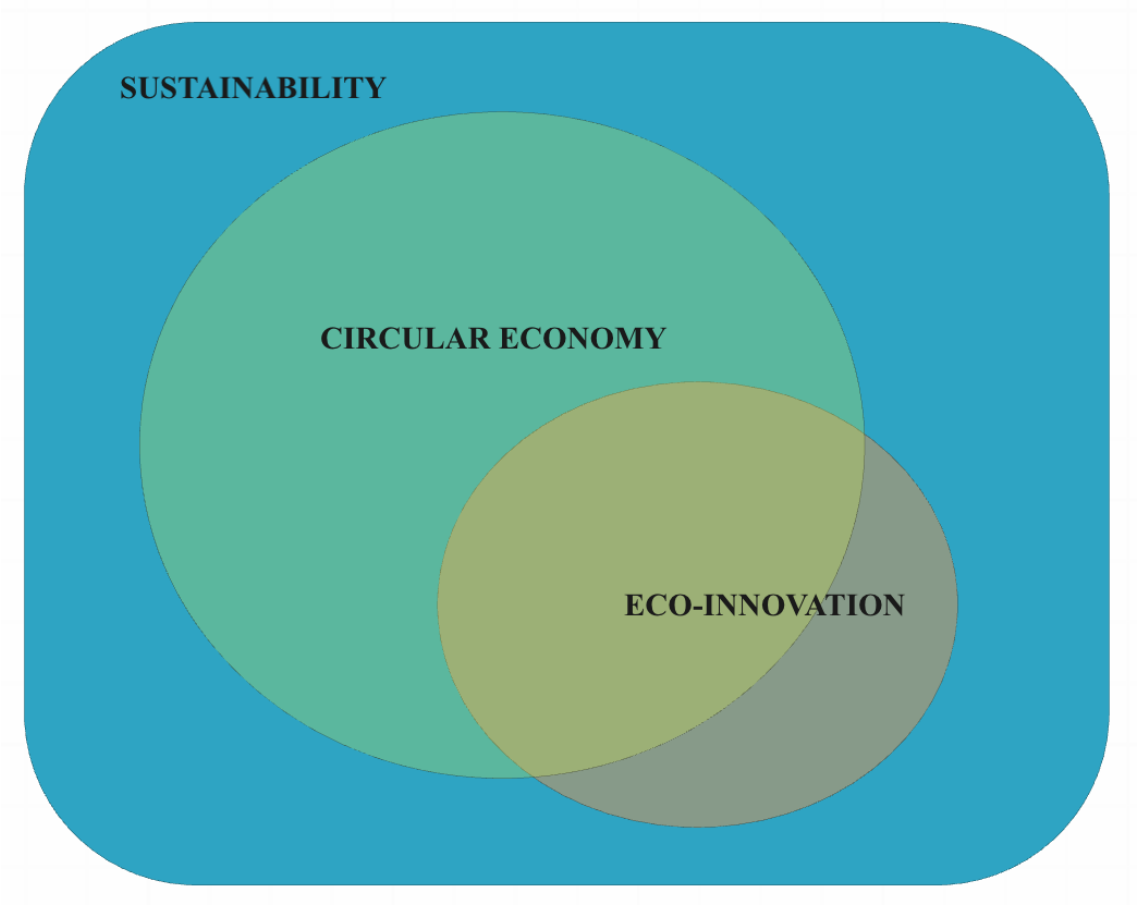

Figure 1. Overlapping of sustainability, circular economy and eco-innovation dimensions.

Owner design adopted from De Jesus & Mendonça (2018), Kiefer et al. (2021), Paraschiv et al. (2022), Prieto-Sandoval et al. (2018).

2. Research questions

CS, CE and EI are inherently dynamic and multifaceted, as they can be analysed from various perspectives, including regulation, policies, technology, financing, and stakeholders (Ahmadov et al., 2023). Linking them to leadership further amplifies their complexity. Studying managers is always challenging due to the limited data available on them, and in this particular area, the lack of theoretical studies makes it even more difficult (Lesage et al., 2024; Walls et al., 2021) Analysing each of these elements, CS, CE and EI, in isolation did not provide sufficient insights for the scarce studies; when we integrated all three concepts, we could make progress while also acknowledging the additional challenges this approach entails. This thesis aims to delve into the complex world of leaders managing SMEs in the realm of the sustainability, the CE and EI.

By exploring various research questions, we will deepen our understanding of these leaders within their specific context, including their relationship with the barriers they face to adopt EI and achieve CE transition. The two first research questions concern to the search for and definition of an integrated theoretical framework that allows us to analyse the relationship between leaders' characteristics and the transition to more sustainable economy. Thus, based upon the potential connections among the theoretical perspectives

included in previous literature (Mahran & Elamer, 2024; Salaiz et al., 2021; Walls et al., 2021), we aim to provide a thorough mapping of the theories that could be used to better understand the relationship among business leaders, sustainability, CE and EI.

RQ 1: How have different theories been used to explain the relationship between leader characteristics, sustainability, CE and EI?

RQ 2: How have different theories been integrated to provide a more comprehensive understanding of the relationship between leader characteristics, sustainability, CE and EI?

The third research question seeks to portray, using archetypes, the leader who champions an SME within the sustainability domain. To address this question, we reviewed the literature within the new microfoundations research field (Felin & Foss, 2005; Teece, 2007), social psychology of leaders, comprehending their motivations and values, intersecting with the domains of CE, EI (the main tool to achieve CE transition), and sustainability.

RQ 3: What is the portrait of a company leader who embraces sustainability, CE and EI?

By addressing the fourth research question, we aim to contribute to the growing but scarce literature that considers leaders as adequate drivers for steering companies toward sustainable transformation (Eiadat et al., 2008; Guoyou et al., 2013; Hart et al., 2019). Therefore, it seems appropriate to unveil how the individual-level psychological traits of leaders matter for the sustainability of SMEs. This research question delves into the personality traits of these leaders and how these traits influence their ability to overcome barriers based on their perceptions. Leveraging the theoretical framework identified through the first research question, we use the most fitting theoretical framework to explore these issues: microfoundations perspective.

RQ 4: Are there specific combinations of leader personality traits and barriers to adopting EI to a more sustainable and CE?

The final two research questions will continue to explore leaders' emotions, values, and personality traits. In this instance, the focus will be on emotions. Arising from the first research question, we observe a lack of studies that delve into the emotions of these leaders. Moreover, it has not been considered how these emotions affect the emotional experience by leaders when faced with a barrier that hinders the adoption of CE activities. This research tries to enhance our understanding of leaders' emotional responses to such barriers.

RQ 5: What emotions do leaders experience when they encounter a barrier that moving forward to forward to a more sustainable and CE?

RQ 6: How do leaders' cognitive appraisals and subsequent emotions influence their choice of coping strategies when dealing with the barriers to a more sustainable and CE?

3. Reflexive epistemology and methodology

We tackle the previous questions from management and psychology perspectives. We use 'behavioural strategy' approach to recognize the role of human aspects (personality traits, emotions, etc.) showed by SMEs leaders in the transition to a more CE or the adoption of EIs. This best understanding would help SMEs to design more effective and transformative strategies. Therefore, the scientific method that is most appropriate for answering the questions posed is interpretivism (hermeneutics), which is gaining relevance in the approach to knowledge in the social sciences and management (Bevir & Blakely, 2018). People are very complex, and their relationship with phenomena can be circumstantial rather than causal, making it necessary to understand processes and entities holistically (Creswell & Poth, 2016). The study of human sciences involves the interaction of personal experience and the reflective understanding of experience. Interpretivism seeks to uncover the motives, intentions, way of life, and all the circumstances that give meaning to an action. For instance, in the study of 'behavioural strategy', interpretivism can be applied to understand the reasons or motives of individuals, such as the leaders of SMEs, and explain their actions and emotions. No object possesses an intrinsic meaning; somewhat, the meaning varies depending on who interprets it.

Once we have situated ourselves epistemologically, we address the methodological process followed in the thesis. In the Chapter 1, we utilise a systematic literature review to conduct a review that comprehensively identifies, assesses, and synthesises all relevant studies on the characteristics of leaders, CE, and EI. This method, with its clear inclusion and exclusion criteria, ensures that our search for information follows a transparent, reproducible, and auditable protocol. This transparency reassures our audience about the reliability of our research, as it allows us to retrieve only the most relevant publications and avoid irrelevant ones. The comprehensive search strategy and straightforward information extraction process further enhance the credibility of our findings (Rhoades & Plantation, 2011). The Chapter 2 uses qualitative comparative analysis method (QCA). It is used to configure personality traits alongside barriers to determine which best explains EI adoption. Instead of decomposing our phenomenon of EI into variables, we focus on the cases we study and the leaders of the SMEs. QCA is based on set theory; the influence of attributes on the outcome depends on how these attributes are combined rather than their individual levels (Ordanini et al., 2014). An essential aspect of this method is that it does not investigate the effect of causes but seeks to understand the cause of the effect to be studied, unlike the Structural Equation Modelling, which examines the effect of various causes on an outcome, QCA is designed to uncover the specific combinations of conditions that explain an observed effect. Rather than analysing the individual influence of each cause, QCA has a distinct goal-to understand the configurations of factors that collectively lead to a particular outcome, highlighting its focus on complex relationships. Additionally,

when there is ambiguous information, it permits confirm directly from the source and consult the case. The epistemological assumptions of this methodology are threefold: (1) equifinality, multiple combinations of causally relevant conditions can lead to the same outcome; (2) a configuration leading to a particular outcome is not simply the inverse of the configuration leading to its absence, and (3) the influence of attributes on a result depends on their combination, not on isolated individual attributes (Medina-Molina et al., 2022). It combines the best of qualitative and quantitative methods (Ragin, 2008). This method is explained in greater depth and applied in Chapter 2.

Qualitative method from a hermeneutic phenomenological approach is used in Chapter 3. It aims to explore the essence of a particular phenomenon or lived experience from those who have experienced it. This method helps to understand how leaders interpret and make sense of their emotions in the face of barriers they encounter while leading their sustainable SMEs. An important aspect of this methodology is that the researcher interacts with the data to unravel the meanings and contexts of the emotional experiences in this interpretative process. The benefits of this methodology are that it provides a deep, nuanced emotional understanding shaped by experience. It seeks underlying and contextual meanings of the emotions and faces with barriers. Moreover, it values the personal perspectives and meanings of the leaders. Another essential characteristic is that it awakens the dimensions of the experienced meaning, constantly steering away from the temptation to theorise, categorise, and abstract. Doing so focuses on life as the leaders´ experience rather than as academia conceptualize it, and it considers the assumptions of the contexts of language, culture, and science (Adams & Van Manen, 2007). Indeed, the methodology and procedures employed and explanations regarding the appropriateness of this method for addressing the research problem are detailed in Chapter 3.

4. Thesis structure / overview of the dissertation

The thesis is structured in four chapters (see Figure 2).

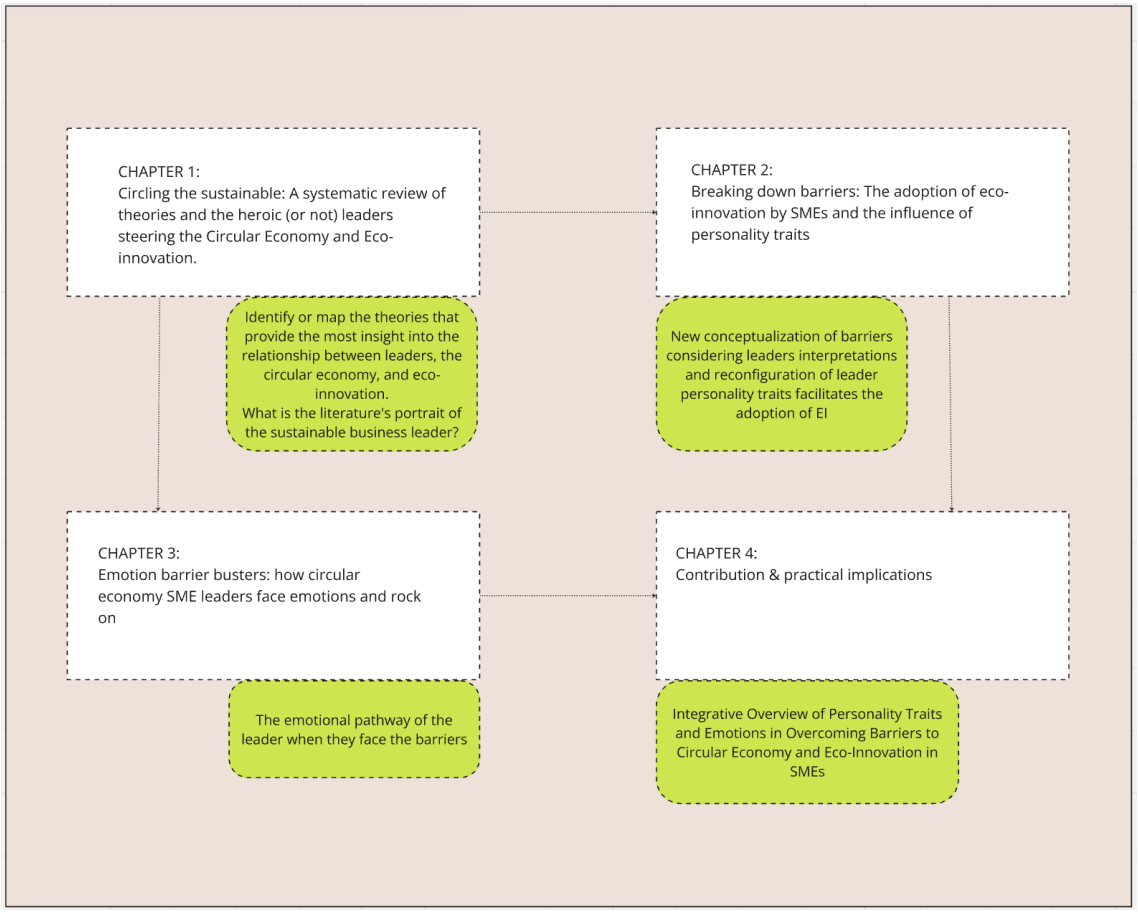

Figure 2. Thesis structure

Chapter 1 presents a systematic literature review that (1) identifies the theories that have studied the microfoundations of leaders within CE and EI phenomena; (2) describes how the literature portrays leaders who aim to adopt corporate sustainability strategies such EI or sustainable practices compatible with principles of CE. In Chapter 1, two primary perspectives used in the studies of leaders' microfoundations are identified: strategic management and psychology perspectives. Based on these theories, we observe which aspects are most studied and how they are explored. Within the management perspective, most theories are concerned with different elements of the company's strategy, including stakeholders, resources, human capital, regulation, etc. Within the psychological approaches, the focus is on managers' behaviour, motivation, and cognition. Generally, it is notable that the upper echelon theory is predominantly used, suggesting that what comes to the organization stems from the leader's reflection. Regarding the portrait of sustainable SMEs leaders, previous research has focused on exploring traits in isolation and typically within two currents: the “dark-side”, which examines negative traits, and the “bright-side”, which looks at more positive traits, such as humility. This upper echelon approach, along with research focusing on unique traits, is one of the reasons why we are unable to view this leader in a more comprehensive, miscellaneous and complex manner, and see them interacting with their environment, and therefore being influenced by them. Indeed, it is crucial to address these gaps to improve our current understanding of leaders’ behaviour, especially in the exploration of traits and mental processes and emotions. This task would enable to gain a more complete picture of how leaders interpret their environment and response to the potential barriers. These gaps will be addressed in Chapters 2 and 3.

Chapter 2 is devoted to the need for a new approach in understanding how different personality traits can be combined to overcome barriers to the adoption of EI with special focus on SMEs. Previous research has often examined these aspects separately, focusing on the barriers and the micro-level analysis of the leader. While prior studies have generated extensive lists of perceived barriers, little is known about how these barriers are processed, interpreted, and overcome. By understanding this, it becomes easier to overcome them. To address this gap, the sensemaking theory, one of the theories identified in the systematic literature review made in Chapter 1 is the only used. Based on their potential to include pyscological behaviour, it is assumed that this theoretical perspective is the most suitable for understanding the interpretation of barriers by leaders (Hahn et al., 2014) and. Moreover, the Qualitative Comparative Analysis is also considered the most appropriate methodology for achieving the research objective: to study how different combinations of personality traits interact with different EI barriers. Therefore, we assume that the obstacles to EI are not universal but depend on the leader's interpretations. This underscores the significant role of the leader in overcoming EI barriers in the SME environment.

Chapter 3 identifies the emotions and reveals the experiential and emotional processes reported by SMEs leaders when encountering a barrier. Using a qualitative methodology, it results in a novel exploration about the leaders of CE SMEs. Interviews were conducted, utilizing NVivo as a support tool for analysis. This methodology allows to discover the emotional pathway, the evaluative thoughts of the emotion, and the subsequent actions taken in response to the barrier, sometimes overcoming it and sometimes not. Thus, the empirical research reveals diverse appraisals, action tendencies and coping strategies that are carried out.

Finally, Chapter 4 presents the main dissertation's contributions and conclusions. Among the contributions, four profiles of leaders who approach barriers differently based on their personality traits and the actions these leaders take after the emotion are identified. In addition, practical implications, enabling leaders and their environments to understand better the impact of their personality traits on overcoming barriers, and the limitations and the opportunities for the future research are also presented. More importantly, it offers optimism by suggesting the potential regulation of their emotions based on this knowledge.

5. Publications and outreach

The process of elaboration of this doctoral thesis has been enriched by the participation in various projects and research groups related to the research lines developed in this thesis.

I am a research member of UNED's Sustainable Finance and Social Responsibility (FINRES) group, with which I have been collaborating and working on various activities and projects.

Research projects in which I have participated with FINRES:

- "Key Aspects of Corporate Culture and Entrepreneurial Leadership in the Transition Towards Sustainable and Circular Economic Models". Funding entity:

Ministerio de Trabajo y Economía Social, 2021. This project allowed us to commence with fieldwork and interviews for research development. The memorandum was presented at a "Circular Economy and SMEs" seminar in February 2021.

- "The Contribution of Companies and Organizations to Society: Measurement Proposal, Identification of Explanatory Factors, and Modelling of Causal Relationships", which is funded by the Ministerio de Ciencia e Innovación, Plan Estatal de Investigación Científica, Técnica y de Innovación, PID2022-136818NB-I00. The project started on 1 September 2023 and ends on 31 August 2027.
- "Agenda 2030 and the SDGs: A Roadmap for Social Responsibility and Sustainability in SMEs". Funding entity: Ministerio de Trabajo y Economía Social. I collaborated in organising round tables for SMEs within the circular economy in December 2024.

I am also participating in a recently launched project with the ISPEC Research Group (International and Spanish Economic Research Group), which is made up of several professors from the Spanish and International Economics Department of the University of Castilla-La Mancha.

- "Industria 4.0 y Eco-innovación: modelos de negocio de Economia Circular en las empresas de manufacturas españolas" (PID2023-151882OB-I00) funded by the Ministerio de Ciencia, Innovación y Universidades, as part of a group in the Department of Economics and Business at the University of Castilla-La Mancha Since the final resolution of the project's call has been communicated in October 2024, collaboration on it is expected to begin from now on.

Likewise, the results obtained have derived in several publications and conference presentations both in the academic field among which the following stand out especially:

- Chapter 2, a significant contribution to our field, was published as a single article in the esteemed journal Business Strategy and the Environment (JCR 5/128 Q1. Impact factor: 13.4). This study, a testament to our collective efforts, has been presented at two prestigious conferences: EIASM Event Manager and Top Managers. European Institute for Advanced Studies in Management, Leeds (April 2023), and ACIEK (June 2023).

- The systematic literature review study, Chapter 1, has been sent to Sustainable Development (JCR 2023 Q1. Impact factor: 9.9) and it is currently under review.

- The hermeneutic phenomenological study (Chapter 3) has been sent to Environment Innovation and Societal Transition (JCR 2023 Q1. Impact factor: 5.7) and it is currently under review.

Recognizing that the dissemination of academic research is crucial for enhancing the impact of scientific discoveries, fostering knowledge exchange, and addressing societal

challenges, I ensured that our research findings were accessible and pertinent to a broader audience. This commitment to societal advancement has the potential to inspire positive change and progress. For this purpose:

- I explained the main findings and implications of the article on Chapter 2 at the Conference I BIHAR *Liderazgo Consciente*, *Gobierno de Navarra, Fundación Caja Navarra, Fundación La Caixa*, Innova program, *Ayuntamiento de Pamplona* in May 2024, Pamplona.

- I participated in a project financed by Fundación ICO. I joined to UNED producing a series of podcasts featuring SMEs in the circular economy, which a sample of the circular economy pioneer interviewed in this thesis. These podcasts aimed to share their overall experiences within the circular economy and their encounters. November 2022.

- I have also participated in a special feature on circular economy and SMEs: "*Grandes desafíos para las pymes*" in the journal El País. This feature addressed the main problems they face in their transition (El País, 2024).

Chapter 1. Circling the sustainable: A systematic review of theories and the heroic (or not) leaders steering the Circular Economy and Eco-innovation

"The shift to a circular economy requires leaders with the vision to rethink processes, inspire systemic change, and drive innovation for a sustainable future"
(Ellen MacArthur Foundation, 2024)

1.1 Introduction

The consequences on the environment, economy, and society resulting from the ongoing exhaustion of natural resources and climate change have highlighted the necessity for individuals, businesses, and governments to change their interacting with the environment (Jhariya et al., 2022). According to the World Economic Forum (2024), environmental risks such as extreme weather events, critical change to earth systems; biodiversity loss and ecosystem collapse, and natural resource shortages are on the top positions in the ranking of global risks by severity over the long term (10 years). To reduce the impact of those inevitable risks, all companies (large and SMEs) must integrate sustainability principles into their corporate environmental strategy. To achieve this purpose, circular economy (CE) has been attracting increasing attention among key business leaders and policy makers (Ellen MacArthur Foundation, 2015). This new model of production and consumption starts to be integrated into the corporate social responsibility agenda of firms to decoupling the resources use from economic growth and attain sustainable development (Nikolaou & Tsagarakis, 2021; Santos et al., 2017; Stewart & Niero, 2018). Furthermore, world policy supports the application of CE practices in the context of the 2030 Agenda to achieve the Sustainable Development Goals (SDGs). Thus, firms seek to develop or optimise CE, by implementing sustainable practices, in terms of both environmental and social fields being corporate sustainability (CS) a fundamental pilar of CE. Similarly, eco-innovation (EI) is key to the transition towards the CE and also central to CS strategies.

In recent years, an increasing number of firms are using CE perspective as a new way of thinking about sustainability and corporate social responsibility (Paraschiv et al., 2012; Fortunati et al., 2020). At the firm level, this new way of thinking mainly involves waste management, reduction and recycling practices to accomplish environmental regulation and customer demand (Ghisellini et al., 2016), but technological innovations are needed to drive circular value across the life cycles of products and processes (De Jesus et al., 2019; Prieto-Sandoval et al., 2018). The adoption of business models that could support circularity (sustainable and circular business innovation models) is essential to CE and CS. However, EI is only a pre-requisite to CE but is not sufficient (Demirel & Danisman, 2019; Kiefer et al., 2024). Although all innovative practices—even non-environmental innovations—can be integrated into CS strategy, not all types of EI are compatible with CE because CE principles go beyond eco-efficiency criteria to achieve a regenerative system by slowing, closing, and narrowing material and energy loops (Geissdoerfer et al., 2017; Schultz & Reinhardt, 2022). Therefore, CS, CE, and EI are different but overlapping concepts.

In the same vein, there is abundant literature analysing the drivers of these three phenomena, but it is based on different approaches and very fragmented. In this respect, it should be noted that all of them distinguishes between internal and external factors and included the influence of leaders as an important internal driver to be considered but not

in an isolated way. Regarding CS, the number of studies that consider the influence of social and psychological characteristics of leaders is very limited (Lozano, 2015; Quinn & Dalton, 2009). Nevertheless, the central role of proactive leaders to the implementation of a CS strategy has been widely confirmed.

Respect to the drivers of CE, cultural-cognitive characteristics of leadership (Ranta et al., 2018), knowledge and skill, management and culture (Govindan & Hasanagic, 2018), socio-cultural characteristics (De Jesus et al., 2019) and risk attitudes (Tura et al., 2019) has been considered as essential factors. However, as far as we know only a limited number of studies focused on leaders' characteristics to CE transition (Soni et al., 2023; Wihler et al., 2024). The existing literature has devoted more attention to the harder drivers of CE (technical, economic) and the softer drivers related to the institutions and regulatory framework and policies needed to CE transition neglecting the role that leaders must develop as the stakeholder that must change their thinking and initiate the challenge to CE through EI compatible to CE principles and their CS strategy.

This perspective is also the one most used when reviewing studies on the drivers of EI. Again, the issue of leadership is considered not in isolation but with other internal and external factors (Bossle et al., 2016; Horbach et al., 2013; Triguero et al., 2013). Moreover, when it is done, it is considered as an internal factor, and it is incorporated through broad measures of environmental concerns, awareness or attitudes. However, it must be recognised that some studies focus on pro-environmental orientation of managers of top executives (Berrone et al., 2013; Chen et al., 2012) and confirm the transformational challenge in the organization that implies EI. This understanding is in line with existing studies on CS drivers. Thus, leadership is included in a similar way in CS and EI. On the other hand, the literature on drivers of EI coincides with that of the CE in the greatest emphasis given to the technological capabilities of the firms (supply), the consumer (demand) and mainly the effect of environmental regulation, neglecting the influence of leaders apart from case studies or perspectives where the environmental orientation and organizational culture of the top executives is contemplated.

Even if previous studies have analysed the crucial role of business leaders to adopt circular EIs inside their CS strategies, mixed results have emerged and clear empirical evidence on the relationship between leader characteristics and CE is still very scarce. The reasons are several. First, most of existing empirical literature refers to leadership as an additional factor but not specifically focuses on leader characteristics as a key driver. In addition, the majority of these studies have focused on large-sized firms (Mazzucchelli et al., 2022; Rizos et al., 2016). Since, SMEs in European Union represent 99% of all businesses, account for more than half of value added in the EU's non-financial business and provide two thirds of jobs in the EU private sector (EC, 2023), they must be considered to gather the potential benefits of CE and achieve a sustainable growth. Thirdly, data on personality traits, habits, mental processes, etcetera, does not usually appear in public databases (Neely et al., 2020; Walls et al., 2021), and demographic characteristics, such as age, religion, or ethnicity, are not enough to delimitate leadership influence. Moreover, measuring and reporting CE is difficult for businesses, mainly for SMEs, and existing studies are based on data retrieved from yearly release CS reports of large firms rather than on firm primary data. Finally, concepts such as CS, CE and EI are linked and overlapped being harder for business leaders to identify the most successful sustainable practices and opportunities. To

address these gaps, the research aims to analyse the relationships between three concepts related to sustainability and circular/performance-based economy practices at firm level, namely CS, CE and EI under the microfoundations lens of leaders (individual level analysis, e.g., psychological traits, is used for firm-level outcomes).

This chapter addresses three main research questions: How have different theories been used to explain the relationship between leader characteristics, sustainability, CE and EI? How have different theories been integrated to provide a more comprehensive understanding of the relationship between leader characteristics, sustainability, CE and EI? What is the portrait of a company leader who embraces sustainability, CE and EI?

Therefore, we want to explore the theoretical perspectives that are used in the microfoundations literature on leaders in the field of CS, CE and EI to have a picture of what today are the parts in which the leaders are most affected (Salaiz et al., 2021). This work wants to advance in the knowledge of the leader who will lead the companies of the future and integrate these dimensions (Walls et al., 2021). It also contributes to the literature on the CE and microfoundations (in this case, the leaders). The first contribution intends to summarise the perspective and theories on leader characteristics in CE area. This allows us to delve deeper and see which theories are in this scope and which are left out, and why. The second contribution is to delineate the leader who directs an SME within CE, that is, to detail and articulate the portrait so that we know what is represented in the literature currently. For that purpose, we carry out a systematic literature review that includes the literature on SC, CE and EI because these are connected and overlap as the microfoundations. This convergence offers an opportunity to challenge traditional management approaches within the portrait of the leader and enables increased knowledge of this kind of sustainable SMEs manager. By exploring these we will get clear indications about who they are and how they act so that we can model them and get to know what this type of leader is like when it comes to sustainable business.

This chapter is the following: first, it introduces the interdisciplinary literature background (section 1.2), outlining key terms, theories, and different characteristics of leaders from firms involved in CS, CE, and EI. Then, the systematic literature review's methodology and procedures (section 1.3). Followed by the results section scrutinises themes, methods, and topics at the intersection (section 1.4). Then, we deliberate on our findings, highlight theories, challenges, and the portrait of these leaders (section 1.5.1), and finish the future research with the connection following the thesis chapter (section 1.5.2).

1.2 Background

1.2.1 Leaders as a driver to CS, CE and EI

Understanding which drivers trigger the firms´ transition to a more sustainable and circular-based economy is also an interesting topic. Despite there is an extensive literature on these drivers, the studies are based on different assumptions, conceptualizations and theoretical approaches (Min et al., 2021; Rizos et al., 2016). To disentangle this question, we analyse how leaders are integrated in the literature related to the drivers for CS, CE and EI.

In the context of CS, leadership is the main driver of CS strategies. Although the number of studies is yet scarce, some scholars confirm that that social and psychological factors are crucial enablers of CS (Lozano, 2015; Quinn & Dalton, 2009). From a holistic perspective, Lozano (2015) identify leadership and specific business cases as the most important internal sustainability drivers, whilst reputation, customer demands and expectations, and regulation and legislation are the most significant external drivers. Conceptual/strategic/visionary competencies, social/interpersonal competencies and self-leadership competencies are identified as facilitators to developing CS (Rego et al., 2017). Leaders who embrace sustainability practices possess peculiar characteristics and mindset compared to the rest (Quinn & Dalton, 2009). Thus, proactive leaders play a further role for the successful implementation and institutionalisation of CS in accordance with stakeholder expectations about sustainability.

Many scholars also have tried to identify the drivers to CE (Govindan & Hasanagic, 2018; Ranta et al., 2018). Based on institutional theory and six case studies, Ranta et al. (2018) identify general and region-specific drivers of and barriers to CE in China, the US, and Europe. Distinguishing by regulatory, normative and cultural-cognitive drivers of CE, they show that regulation is not enough to support the institutional change implicit in the CE transition. Normative and cultural-cognitive conditions also influence on the CE adoption. In this regard, the cultural-cognitive system will play a crucial role in the establishment of societal expectations and structures that guide a new way of thinking or CS. Since common beliefs, shared logic of action, and isomorphism configured this cultural-cognitive system, the role of leaders in CE is acknowledged. Govindan and Hasanagic (2018) neither include clearly the potential influence of leaders on the drivers of CE (policy and economy, health, environmental protection, society, and product development), but some of the identified barriers to CE are related to the business leader: knowledge and skill, management and culture. Since socio-cultural barriers have been identified as a main obstacle to the implementation of CE, mainly in SMEs, and risk averse behaviours by leaders (Rizos et al., 2016; Tura et al., 2019). Despite these contributions, few studies have focused on the influence of leadership characteristics to CE transition. In a recent study, Wihler et al. (2024) examined the pivotal role of leaders in reshaping organizational practices from linear to CE. Based on a case study, they support that leaders face bigger complexities when implementing circular business models and need additional leadership orientations related to progress, principle, performance, and people. Based on distributed leadership assumption, defined as sharing of leadership between employees and managers, Soni et al. (2023) identified collaborative approaches, intuitive working relations, institutionalised practice, and planful alignment as leadership characteristics to facilitate CE adoption. These findings are consistent with studies that assume that EI is the primary tool for the transition to CE. In this regard, De Jesus & Mendonça (2018) distinguishes between "harder" (technical, economic) and "softer" drivers (social, institutional, regulatory). Following them, the institutional and regulatory drivers have been the factors more analysed in the existing literature, positioning policies at the centre to help towards this CE transition. However, regulatory changes alone will not be enough to achieve a more circular production system (Hart et al., 2019). A change in stakeholders' behaviour and attitudes is needed. One of these stakeholders are firm managers. If CE is seen as a business opportunity, firm leaders would have a positive view towards its implementation. Therefore, managers who look for new and innovative solutions can assist them by developing an alternative vision (Eikelenboom & De Jong, 2022).

Nor are there too many differences to what has already been pointed out, with reference to the drivers of EI. There is a very extensive literature, which distinguishes between regulatory push/pull, technology push and market pull (Horbach et al., 2013); external and internal factors (Bossle et al., 2016), or the influence of cooperation or stakeholders (Triguero et al., 2013), but there are also fewer studies that focuses exclusively on the influence of the leader characteristics on EI. As Bossle et al. (2016) points out "the construct managerial environmental concern is perhaps the strongest determinant of environmental innovation strategy", but the empirical studies have not deeply analysed what are the characteristics of the eco-innovative leader being considered in the analysis variables such pro-environmental awareness, environmental managerial attitudes, environmental leadership, environmental culture or environmental capability. The studies that are probably most successful are those that distinguishes between pro-active and reactive green innovators. Chen et al. (2012) distinguishes between the internal and external origins of EI and argue that only internal origins can facilitate pro-active EI processes. These internal origins of EI are environmental leadership, environmental culture, and environmental capability. Therefore, environmental managerial concerns, environmental leadership, environmental culture and environmental capability has been studied as drivers of EI but there is need more information about the peculiar characteristics of these leaders. Although it is recognised that environmental managerial concerns play an important role in the adoption of EI and the integration of sustainability of CE principles in their CS strategy, the environmental leadership and culture are essential to adopt EI (Berrone et al., 2013; Chen et al., 2012). This environmental culture of leaders inside the firm is related to a "symbolic context about environmental management and protection within which interpretations guide behaviours and processes of members´ sense-making and set of values and norms describing how the company perceives the environmental variable" (Cameron & Quinn, 2011, p. 80). Undoubtedly, a pro-environmental organizational culture is needed to adopt EI and integrate the principles of CE inside CS. Therefore, the characteristics of leaders must be analysed in more detail.

According to Urbinati et al. (2017), it is important to note that leaders are prompted to implement sustainability due to diverse stakeholder influences or pressures. (See fig. 1). This way, their perception and attitude will help overcome internal difficulties such as insufficient knowledge (Redmond et al., 2008). Furthermore, stakeholder demand will lead to a proactive or non-proactive attitude toward environmental initiatives (Guoyou et al., 2013). This leaders' proactivity positively impacts environmental issues and makes teams more willing to collaborate (De Medeiros et al., 2018). Also, their commitment makes them accept their legitimate responsibility towards the environment issues (Eiadat et al., 2008).

Therefore, behind many of the responses to the actions that lead a company to engage in the adoption of CS, CE and EI are the attitudes of the leaders (Walls & Berrone, 2017). The upper echelons theory suggests that organizations become reflections of their top managers (Hambrick & Mason, 1984) and has been widely used into research in sustainability and leaders. Recent studies recognise the importance of leaders in the move towards sustainability (García-Sánchez et al., 2021; Graafland & Bovenberg, 2020; Jun et al., 2021; Tang et al., 2018). If the role of leaders is essential to bring about sustainability, it is necessary to explore their characteristics (Walls et al., 2021). Interactions and pressures

with the business context are also incorporated on studies on environmental CS and EI (Eiadat et al., 2008; Guoyou et al., 2013; Walls et al., 2021). In a context of uncertainty, individuals may have different opinions and ideas about what can work and what cannot. Therefore, it seems appropriate to analyse these leaders' personality traits to see how difficulties are overcome differently by them (Felin et al., 2015).

1.2.2 Microfoundations and drivers to CS, CE and EI

Since the individual analysis of leaders is a critical issue, focusing on microfoundations in the context of CS, CE and EI are necessary. The microfoundations literature is divided into (1) motivational drivers, (2) managerial cognition, and (3) personality traits (Salaiz et al., 2021; Walls et al., 2021).

First, motivational drivers refer to motivations, general belief system, or ideologies. Cropanzano et al. (2001) differentiate into three drivers: instrumental, relational, and moral drivers. Instrumental drivers refer to the psychological need to overcome concerns and are rooted in economics. If CS brings a financial benefit, then the activities around CS will be justified. From the individual analysis perspective, these drivers, will lead to decisions that will benefit the decision-maker, that is, are based on self-interest or respond to a need to alleviate pressure from stakeholder groups (Harjoto & Jo, 2011; Patel & Holm, 2018). In the first case, as the agency theory explains, leaders get involved in sustainability because it benefits them directly, for example, through an economic reward. In the second case, from a conflict-resolution perspective leaders feel very exposed to others and do not want problems (Salaiz et al., 2021). Relational drivers activate the part of belonging to a social group to develop certain relationships. This driver is activated by leaders who act under the premise of being responsible. These leaders will not only direct their interests towards shareholders but also keep stakeholders in mind. This driver has a lot to do with responsible leadership, which includes ethical decisions, value-based leadership, and stakeholder relations. Leaders with a well-being orientation develop an integrative leadership style with a dual sense of achieving financial and non-financial stakeholder goals (Maak et al., 2016). Moral drivers concern personal values and drive the need for a meaningful existence. From the company's point of view, leaders can act towards or against CS, depending on their social and environmental values. The difference between these moral drivers and ethical leadership is that the former does not correspond to rational ethical behaviour, but to an automatic and non-deliberate reaction to an action or activity within sustainability (Weaver et al., 2014). Other researchers argue that ideology also affects decision-making when implementing sustainable strategies (Hafenbrädl & Waeger, 2017).

Secondly, managerial cognition research on socio-psychological perspectives analyses everything that has to do with cognition and the individual traits of these leaders as they may affect the results of the enterprise. Cognition encompasses cognitive processes, including attention, recall and reasoning (VandenBos, 2009). These mental processes also contribute to leaders' different behaviours and capabilities. In sustainable managerial behaviour two aspects must be considered: the integrative cognitive complexity to meet the challenges and the individual experience, including emotions. These experiences filter the mechanisms and complexity to achieve (Salaiz et al., 2021).

Finally, personality traits studies refer to distinct attributes, qualities or personal characteristics that are considered enduring (Visser & Courtice, 2011). In this group, it is

interesting to explore the predominant traits in firms' leaders who want to carry out a transformation towards sustainability, such as positive traits (humility or an open mind) and negative traits (narcissism, egocentrism, or arrogance). Lastly, emotions play a fundamental role on the one hand because they situate us in how the person is placed before a message and how emotions help to overcome certain situations if we know what is happening in the person (Walls et al., 2021). In the literature on emotions and sustainability, the following distinction is made: 1) moral emotions, shame, guilt, or gratitude, which are the ones that appear as the most common emotional driver in CS microfoundations research (Eisenberg, 2000; Salaiz et al., 2021). Moral emotions play a crucial role in most ethical judgments and decisions (Pizarro et al., 2011). 2) Basic emotions, such as contempt, sadness, or anger, which are more direct and can appear during development when culture has less influence. They are considered universal and can be recognised through direct bodily expressions (Izard, 1992). These emotions have been examined as predictors of moral behaviours (Eisenberg, 2000). 3) Finally, emotions directly connected to the natural environment, biophilia or biophobia, express either love or fear towards nature, generating an effective response for or against the natural environment (Walls et al., 2021). See Figure 3.

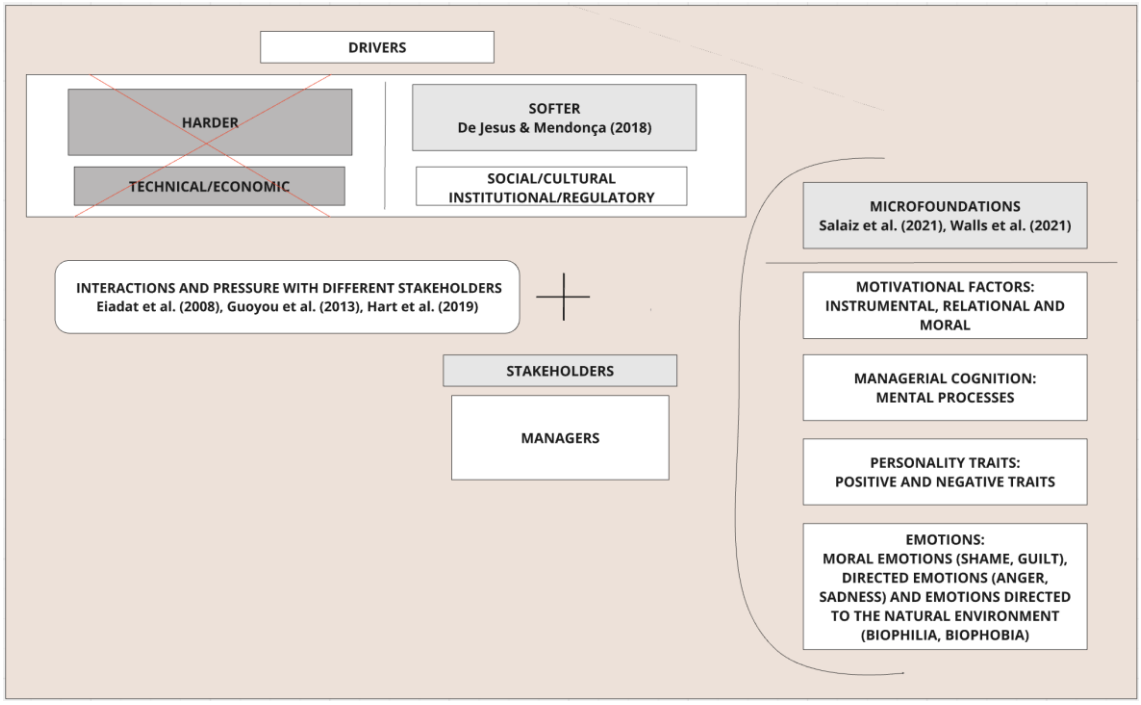

Figure 3. Microfoundations perspective: leaders as a driver.

The scarcity of microfoundations literature about leaders in the context of sustainable and circular business innovative models has prompted us to carry out the following systematic literature review. This review includes the search of literature on CE, CS, and EI, and intends to scrutinise the most relevant perspectives and topics to analyse the role of leaders' characteristics on these dimensions. This convergence offers an opportunity to challenge traditional management approaches within the portrait of the leader and enables us to know more about the archetype of a SMEs manager who show a high awareness with sustainability, CE and EI adoption.

1.3 Methodology and overview of results

1.3.1 Methodology: systematic literature review

In the first step, we examine papers selected through the "SUBJECT" field (Title, Abstract and Keywords) in the Web of Science Core Collection database, including the databases SCI-EXPANDED and SSCI. Although we could have also used other databases such as Scopus or EBSC, WoS appears most widely for systematic reviews in our discipline in most cited publications (Bossle et al., 2016; Merli et al., 2018). Our review process employed a key-inform search strategy to locate academic articles pertinent to identifying the most relevant words within the domains of sustainability, CE, and EI, as well as the individual characteristics of the leaders when adopting practices from the above domains. Specifically, we focused on articles published from 1956 for SSCI and 1900 for SCI-EXPANDED, which is the default; we do not modify these dates because we are interested in displaying all publications in English, no matter how old. We utilised the following Boolean algorithm (see Table 1):

[TS= (combination of the keywords with circular economy, eco-innovation, corporate sustainability)]
AND
[TS= (combination of the keyword leader)]
AND
[TS= (combination of the keyword microfoundation)]

Table 1. Combinations of each of our main words for the study

Keywords	Combinations of the key with "OR"	Database	Advanced search
Corporate sustainability Circular economy Eco-innovation	"corporate sustainability", "sustainable business model", "circular economy", "circular business model" "environmental sustainability", "eco business model", "green innovation*", "environmental innovation*", "eco-innovation" "responsible innovation"	Web of science	TS = Topic Advanced Search WOS Core Collection English All years SCI-EXPANDED SSCI
Leader	"CEO*", "board* of director*", "leader*", "manager*", "director*", "entrepreneur*"		
Microfoundation	"microfoundation*", "person*", "trait*", "emotion*", "behavio* strateg*", "managerial		

	cognition*", "cognition*", "positive organizational scholarship", "individual level"	

In the second step, we reviewed all the titles of the 176 articles, the works that Boolean algorithm identified. We screened all the manuscripts to select those that evaluated the characteristics of leaders in the sustainable domains. The exclusion criteria were as follows:

- Studies not written in English as the standard language criteria.
- Studies analysing the characteristics of employees rather than leaders.
- Studies in the field of CSR (corporate social responsibility) those addressing the social and ethical impact.

In this screening step, we excluded 5 of them as we detected from the title that they did not correspond to the topic under consideration. We manually reviewed the abstracts and keywords of the 171 articles. We excluded those irrelevant (128 articles) to our research, as indicated in the exclusion criteria above. In the last step, we read the full content of 43 articles in detail and discarded those that could not be discarded by reading the abstract. The final sample consisted of 45 articles (see Table 2), 41 from close reading, and 4 from cross-citation.

The identification, screening, and inclusion process rigorously adhered to the PRISMA principles (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), adopted as a method for conducting systematic literature reviews (Beller et al., 2013; Sarkis-Onofre et al., 2021). Implementing the PRISMA methodology in the literature review provides an adequate set of elements that guarantee the review process is conducted in a structured and consistent manner (Holden et al., 2014). See Figure 4 for the search and PRISMA methodology.

Table 2. Categories of microfoundations (Salaiz et al., 2021), theory/perspective, methodologies and keywords of each article of the systematic review.

Reference of articles systematic literature review	**Micro foundations**	**Theory/ perspective**	**Research method**	**Themes/keywords**
Abatecola & Cristofaro (2019)	Personality traits	Upper echelons theory (strategic management)	Conceptual (systematic review)	Power, behavioural strategy, sustainability, managerial discretion, narcissism, and hubris

Agyabeng-Mensah et al. (2023)		Leader-member exchange theory Contingency theory (strategic management)	Quantitative	Ethical leadership, circular economy, sustainable chain ethical leadership, circular sustainable chain
Arena et al. (2018)	Personality traits	Upper echelons theory (strategic management)	Quantitative	Managerial discretion, hubris, CEO, eco-innovation, individual level
Ben Amara & Chen (2022)	Motivator driver	Institutional theory (strategic management)	Quantitative	Entrepreneurs, Eco-innovation, driving forces
Boiral et al. (2018)	Managerial cognition	Theory of consciousness development (psychological)	Mixed	Developmental psychology, organizational citizenship behaviours, corporate greening, environmental beliefs.
Bouguerra et al., (2021)			Quantitative	MNE, Machiavellian collaboration, individual Machiavelli, operational agility
Chassé & Courrent (2018)	Motivator driver	Upper echelons theory Managerial discretion theory (strategic management)	Quantitative	SME, owner-managers, sustainability behaviours, attitude
Cheffi et al. (2023)	Motivator driver	Upper echelons theory (strategic management)	Quantitative	Ethical leadership, SME, circular economy
Eide et al. (2020)		Self-determination theory (psychological)	Quantitative	Transformation leadership, sustainability, leaders' motivation, firm performance

Friedrich & Wüstenhagen (2017)		Institutional theory Theory of grief (strategic management)	Conceptual	Sustainability, emotions, stages of grief, decision-making
García-Sanchéz et al. (2021)		Resource and capacity theory (strategic management)	Quantitative	Eco-innovation, board of directors, female directors
Graves et al. (2013)		Self-determination theory (psychological)	Quantitative	Transformational leadership, sustainability, motivation
Gröschl et al. (2019)	Managerial cognition	Cognitive Complexity theory (psychological)	Qualitative	Microfoundation, CEO, sustainability, managerial cognition
Hahn et al. (2014)	Managerial cognition	Cognitive categorization theory (psychological) Sensemaking theory	Conceptual	Sustainability, managerial cognition, cognitive frame
Haney et al. (2020)	Motivator driver	Experiential learning theory	Qualitative	Sustainability leadership, experiential learning, education
Hansson et al. (2022)			Qualitative	Sustainability, business model innovation process, business decisions
Herbert et al. (2023)	Motivator driver	Value-belief-norm theory (Machiavellian)	Quantitative	"Bigger-than-self", biodiversity, leader, sustainability
Hoogendoorn et al. (2019)		Theory of Institutional of entrepreneurship Theory of entrepreneurship (strategic management)	Qualitative	Entrepreneurs, barriers, sustainable entrepreneurship
Khanchel et al. (2023)	Personality traits	Upper echelons theory (strategic management)	Quantitative	CEO narcissism, green innovation, CEO age, CEO international, "dark-side" of narcissism

Koistinen et al. (2022)	Personality traits	Structuration theory	Qualitative	Behavioural perspective, circular economy, transition, power, microfoundations
Kurki & Lähdesmäki (2023)	Managerial cognition	Psychological ownership (psychological)	Qualitative	Individual level, sustainability, MNEs
Leonelli et al. (2022)	Personality traits	Upper echelons theory (strategic management)	Qualitative	Sustainability, narcissism, entrepreneur
Lin et al. (2022)	Personality traits	Agency theory (strategic management)	Quantitative	Sustainability, narcissism, hubris, CEO, firm performance
Mahran & Elamer (2024)	Personality traits	Upper echelons theory (strategic management)	Conceptual	CEO characteristics, corporate environmental sustainability, environmental disclosure, environmental performance, theories, ethical leadership
Martinez (2019)	Managerial cognition	Institutional theory Faith development theory (strategic management)	Quantitative	Sustainability, faith
Murcia & Acosta (2022)	Managerial cognition		Quantitative	Sustainability, leadership, cognitive frame
Van Opstal & Borms (2023)			Quantitative	Circular economy, entrepreneurs, startups, B2B, B2G
Papagiannakis & Lioukas (2018)		Norm-activation theory (psychological)	Quantitative	Sustainability, microfoundation, charisma leadership, CEO
Pelster & Schaltegger (2022)	Personality traits	Upper echelons theory (strategic management)	Quantitative	Psychology theory, sustainability, dark triad,

Rego et al. (2017)		Sustainable strategy management approach (strategic management)	Qualitative	Corporate sustainability, content analysis, CEO
Ringvold et al. (2023)			Qualitative	Sustainable business model innovation, microfoundation, strategy management
Robertson & Barling (2013)			Qualitative	Transformation leadership, employee, green leadership, harmonious environmental passion
Soni et al. (2023)			Qualitative	Circular Economy, SMEs, leadership adaption, distributive leadership
Sun et al. (2021)	Personality traits	Upper echelons theory Managerial discretion theory (strategic management)	Quantitative	Humble, CEO, Eco-innovation
Swaim et al. (2016)		The theory of planned behaviour (psychological)	Quantitative	Sustainability, managerial concern, firm performance
Tang et al. (2018)	Managerial cognition		Quantitative	Eco-innovation, organizational behaviour, supply managers sustainable, cognitive frame
Tiberius et al. (2021)	Motivator driver	Dynamics capabilities theory (strategic management)	Qualitative	Microfoundations, sustainability, family firms, social, ecological and economics dimensions
Venugopal et al. (2023)	Personality traits	Upper echelons theory	Quantitative	CEO, personality traits, corporate sustainability, cybernetic big five personality
Visser & Courtice (2011)	Personality traits		Conceptual	Individual characteristics, sustainability leadership, traits

Walls & Berrone (2017)		Institutional theory (strategic management)	Quantitative	CEO, power, environmental performance, behavioural strategy
Walls et al. (2021)	Personality traits	Positive organizational scholarship (strategic management)	Conceptual	Leaders, microfoundation, behavioural strategy, corporate sustainability, sustainability change agent, Positive organizational scholarship
Wang et al. (2021)		The theory of planned behaviour (psychological)	Quantitative	Diffusion of innovation theory, eco-innovation, leaders, waste separate, social networks
Yamoah et al. (2022)	Motivator driver		Qualitative	CEO, circular economy, stakeholders, and value chain
Ye et al. (2020)		Institutional theory (strategic management)	Quantitative	Green entrepreneur, push-pull-mooring, intensions
Zhang et al. (2020)	Personality traits	Upper echelons theory Institutional theory (strategic management)	Quantitative	CEO, hubris, pollution, environmental performance

(*) Blank if no categorization is applied

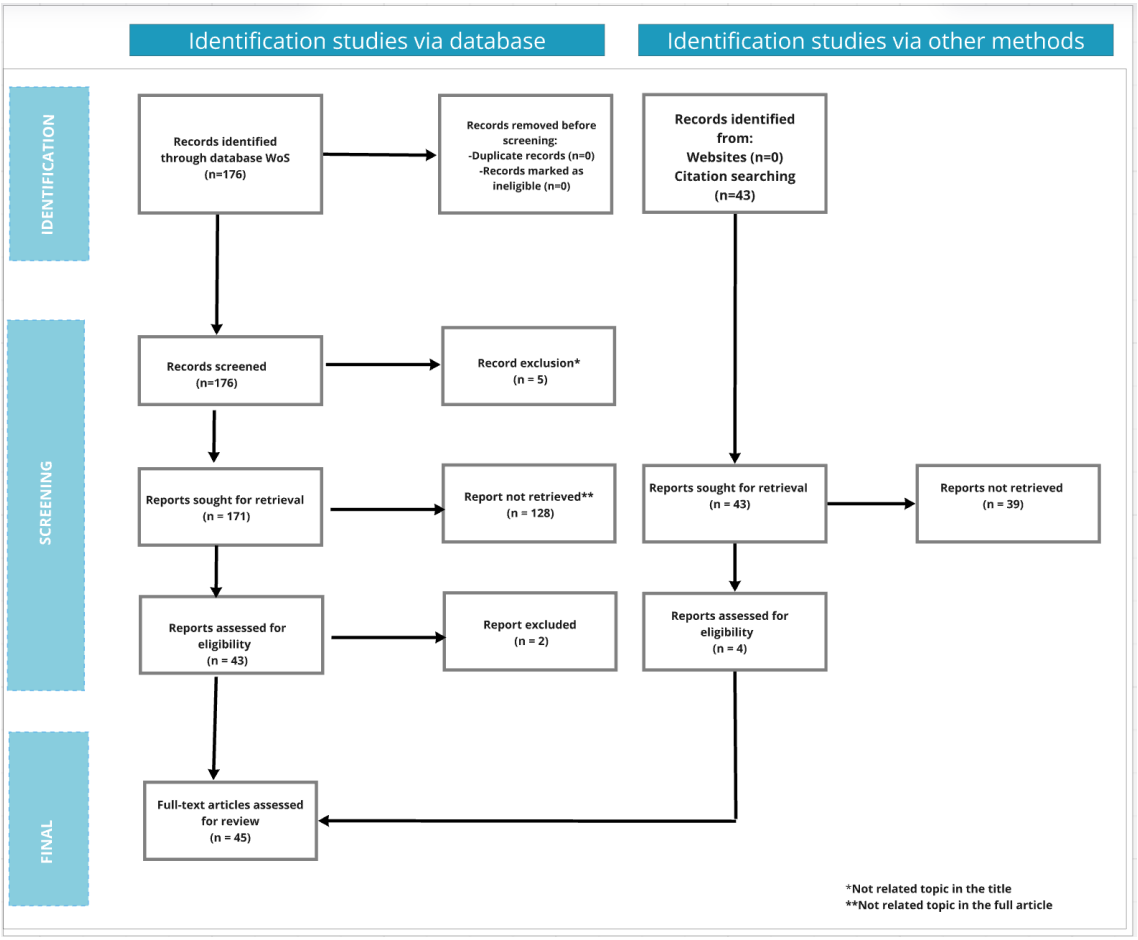

Figure 4. PRISMA flow chart of the systematic literature review.
Source. Authors' elaboration.

1.4 Results

The synthesis of existing evidence is ordered into two subsections: first, the perspectives and theories used in the literature are briefly described, see Figure 5; second, the portrait of the leaders, their classification and leadership from firms who adopt CE are presented. See Figure 6.

1.4.1 Theoretical perspective on CS, CE, EI and their leaders

Observing the adoption of CE at the company's most individual level, the main perspectives the studies use to approach the intersection of CE and leaders are: 1) Psychological perspective (24.4% of the total studies); 2) Strategic Management perspective (53.3%:) and 3) Other perspectives (4.4%). Please refer to Table 3 for more details about the articles, theoretical contributions, and authors who first presented these major breakthrough theories.

Table 3. Perspective and theories, keywords of theory/article, seminal authors and the list of articles included in the systematic literature review.

Theories	Keywords Theory/Article	Main theoretical Contribution	Seminal articles	Articles included in the systematic literature review
Psychology perspective				
The norm-activation theory	Behaviour	This theory postulates three antecedents to prosocial consumer behaviours: awareness of consequences, attribution of responsibility, and personal norms. Consequence awareness refers to an individual's awareness of the negative consequences for others of not acting prosocial.	Schwartz (1977)	Papagiannakis & Lioukas (2018)
Value-belief-norm theory	Behaviour	Value-belief-norm theory of environmentalism provides a framework for investigating normative factors that promote sustainable attitudes and behaviour.	Stern (2000)	Herbert et al. (2023)
The social comparison theory	Behaviour	It draws the idea that individuals determine their own social and personal values	Festinger (1954)	Robertson & Barling (2013)

		based on how they compare themselves.		
Theory of planned behaviour	Behaviour	The theory seeks to explain all behaviours over which people can exercise self-control. The critical component of this model is behavioural intention; behavioural intentions are influenced by the attitude about the likelihood that the behaviour will have the expected outcome and the subjective evaluation of the risks and benefits of that outcome.	Ajzen (1985)	Swaim et al. (2016), Wang et al. (2021)
The self-determination theory	Motivation	It is an established theory of motivation in psychology that postulates that multiple types of motivations are distinguished by their levels of autonomy, competence, and relatedness	Deci & Ryan (1985)	Eide et al. (2020), Graves et al. (2013)
Cognitive categorization theory	Cognitive	It describes how humans learn to observe their environment and sort objects or experiences into classes. The ability to classify objects, ideas, and events is an unconscious process known in	Mervis & Rosch (1981)	Hahn et al. (2014)

		psychology as cognitive categorization		
Cognitive complexity theory	Cognitive	It is used in psychology, organizational psychology, and human-computer interaction. It describes the ability or processes of individuals to perceive things in the world around them. People with more complex cognition can see nuances and meanings.	Tetlock (1988)	Gröschl et al. (2019)
Consciousness development theory	Cognitive	It focused on the psychological aspects that make up the reason for being, underlying motives, and the worldviews of individuals.	Cook-Greuter (2000, 2004), Deci & Ryan (1985)	Boiral et al. (2018)
The psychological ownership theory	Cognitive	The core of this theory is the feeling of possession and a sense of being psychologically tied to an object, as the state in which individuals feel as though the target of ownership or a piece of that target is theirs.	Pierce et al. (2003)	Kurki & Lähdesmäki (2023)
Strategy management perspective				
Upper echelons theory	Characteristics of leader	Organizations become reflections of their top managers	Hambrick & Mason (1984)	Abatecola & Cristofaro (2019), Arena et

				al. (2018), Chassé & Courrent (2018), Cheffi et al. (2023), Khanchel et al. (2023), Leonelli et al. (2022), Mahran & Elamer (2024), Pelster & Schaltegger (2022), Sun et al. (2021), Venugopal et al. (2023), Zhang et al. (2020)
Institutional theory	Regulation	This theory emphasises the informal understandings and cognitive frameworks that shape the social structure of markets. The three pillars of the institution, namely the regulatory, normative, and cognitive cultural pillars, are the three elements that social theorists consider a vital to the institution.	DiMaggio & Powell (1991)	Ben Amara & Chen (2022), Friedrich & Wüstenhagen (2017), Hoogendoorn et al. (2019), Martinez (2019), Walls & Berrone (2017), Ye et al. (2020), Zhang et al. (2020)
Agency theory	Stakeholders (Investors)	It is most commonly used to explore and	Jensen & Meckling (1976)	Lin et al. (2022)

		resolve issues between business and the agency of some company executives.		
Leader-member exchange theory ~~~~~~~~~~~~~~~~~~~~~~~~ Contingency theory	Stakeholders (Supply chain)	It focuses on the relationship between leaders and subordinates and how it influences subordinates. ~~~~~~~~~~~~~~~~~~~~~~~~ It claims that the interaction of enterprises with the internal and external environment cold affect their performance and practices.	Graen et al. (1982), Liden et al. (1997) ~~~~~~~~~~ Lai et al. (2015)	Agyabeng-Mensah et al. (2023)
Resource and capabilities-based theory	Resources (Independent and knowledge)	A theory contends that possessing strategic resources can provide an organization with competitive advantage over its rivals. Resources that competitors cannot easily duplicate are often protected by various legal means, including trademarks and copyrights.	Barney (1991), Wernerfelt (1995)	García-Sánchez et al. (2020)
Dynamics capabilities theory	Resource (Human capital)	It allows obtaining competitive advantages not only through the use and combination of competencies and resources but also considering the dynamic changes	Teece et al. (1997)	Tiberius et al. (2021)

		and requirements of the environment.		
Positive organization scholarship	Leadership	It is primarily concerned with the study of the particularly positive outcomes, processes, and attributes of organizations and their members. Positive organization scholarship does not represent a single theory but focuses on dynamics often described by words such as excellence, prosperity, flourishing, abundance, resilience, or virtuosity.	Cameron et al. (2003)	Walls et al. (2021)
Sustainable strategy management approach	Resources (Shared value)	Sustainable strategic management (economic competitivity, and social responsibility, in balance with the cycles of nature) is required from business organizations due to the competitiveness in today's sustainability-rich world.	Stead & Stead (2000)	Rego et al. (2017)
Sensemaking theory	Decision-making	The sensemaking process entails three stages: scanning for information,	Daft & Weick (1984)	Hahn et al. (2014)

		interpreting that information, and then identifying and evaluating alternatives of action.		
Other theories				
Structuration theory	Resources	It is a social theory about the creation and reproduction of social systems, which is based on the analysis of both the structure and the agents involved, without giving priority to any of them.	Giddens (2014)	Koistinen et al. (2022)
Experiential learning theory	Education	Learning by doing is the basis for the experiential learning theory. Experiential learning focuses on the idea that the best ways to learn things is by having experiences. Those experiences then stick out in your mind and help you retain information and remember facts.	Kolb (1984)	Haney et al. (2020)

1.4.1.1 Psychological perspective

There are different theories under the psychological domain that are used as an approach. Most of the approaches are concerned with managers' behaviour, motivation, or cognition. These three keywords were used in the systematic literature review.

Behaviour and motivation theories

Applying psychological theories contributes to a complete understanding of behaviour and motivation of business managers. 7 of the 11 total studies rely on behaviour

and motivation theories (Eide et al., 2020; Graves et al., 2013; Herbert et al., 2023; Papagiannakis & Lioukas, 2018; Robertson & Barling, 2013; Swaim et al., 2016; Wang et al., 2021). According to Papagiannakis & Lioukas (2018), charisma leadership reinforces the relationship between personal norms and environmental management initiatives. This study based on the norm-activation theory (Schwartz, 1977) argues that behaviour is the response to personal norms. Another behavioural theory is the value-belief-norm theory (Stern, 2000), explicitly showing how the set of values affects manager´s conduct. The study from Herbert et al. (2023) explores whether leaders in SMEs focusing on sustainability and with a "bigger-than-self" values component prioritise biodiversity issues. The conclusion is that they do not and that being the case, it is indispensable that the importance of biodiversity loss begins to be considered both normatively and collectively. Continuing with individual values, social comparison theory (Festinger, 1954), concludes that personal values are based on how individuals compare themselves to others. In this case Robertson & Barling (2013) draw on how leaders with transformational leadership specific to the environment can encourage pro-environmental behaviour in the workplace by influencing their employees' environmental passion and behaviour.

Another study applies the theory of planned behaviour (Ajzen, 1985). This theory is widely used to work out everything related to individual behaviour towards waste management, e.g., the intention of waste separation. Wang et al. (2021) examined leaders' views on network communication concerning EI, e.g., waste management, and how they affect attitude, but not necessarily the ability to perform such behaviour. Swaim et al. (2016) explore how managers' personal environmental motivation influences work behaviour for sustainable suppliers. Finally, we found 2 articles applying the self-determination theory (Eide et al., 2020; Graves et al., 2013). Both articles conclude that a transformational leader mediates the relationship between leaders' motivation and the company's sustainability strategies. This leader generates inspiration in the company's employees towards sustainability.

Cognition theories

Only 4 articles explore possession and a psychological sense of being and the cognitive process. They are based on the theory of consciousness, the psychology ownership theory, cognitive complexity theory and cognitive categorization theory (Boiral et al., 2018; Gröschl et al., 2019; Hahn et al., 2014; Kurki & Lähdesmäki, 2023). Among the four theories discussed, we will emphasize the significance of psychological ownership in this review, as it provides a suitable framework for understanding organizational management and the role of individuals in fostering sustainability thinking. At its core, this theory revolves around feelings of possessiveness and a psychological connection to an object (Pierce et al., 2003). While it is often associated with person-object relationships, psychological ownership can also extend to other people, intangible objects, ideas, words, groups, organizations, and jobs (Van Dyne & Pierce, 2004). In this context, we focus on the sense of ownership related to CS. It is important to note that psychological ownership is typically linked to positive outcomes (Van Dyne & Pierce, 2004), such as an enhanced sense of responsibility. However, in some situations, it can also lead to an overwhelming burden and cause stress (Pierce et al., 2003; Valor et al., 2018).

Hahn et al. (2014) join cognitive categorization theory with the sensemaking perspective (see the strategy management perspective, 4.1.2). They explore the difference between the two cognitive frames of managers, "business case" -thinking in terms of profitability- or "paradox" -embracing tensions that are contradictory, e.g., collaborate and compete. Boiral et al. (2018) deal with the role of consciousness and the manager's states of consciousness. Overall, this cognitive frame clearly does not focus on the company context, but on managers personal experience, history, and the leader's frame of reference. Finally, the article by Kurki & Lähdesmäki (2023) suggests that in the context of the CS, the feeling of possession over the concept of sustainability can either strengthen or hinder it depending on whether individuals are encouraged to reflect and if support is provided in three keyways: developing deep knowledge, having control, and investing in oneself.

1.4.1.2 Strategy management perspective

There are also different theories under the management domain that are used in the studies reviewed. Most approaches are concerned with the different elements within the company's strategy; among them are the stakeholders, resources, human capital, regulation, etc.

Upper echelons theory

The upper echelons theory is the most used in our literature review and has a fundamental premise: organizations become reflections of their top managers as Hambrick & Mason (1984) suggested in their seminal article. The sociodemographic characteristics of managers can represent a proxy for cognitive values and, therefore, for decision-making. These sociological variables are, for example, age, functional background, professional experiences, education, socioeconomic background, and economic position.

11 of 24 reviewed studies use strategy management perspective. Half of these studies also work with managerial discretion theory which stays that leaders act, usually giving more priority to what affects them than to what is suitable for the company. In most of these studies, the leader's characteristics are mostly related to their personal traits: hubris, narcissism, humility, dark triad, etc. The outcome of these studies always explore sustainable and unsustainable practices in the company, such as pollution, waste separation (Zhang et al., 2020), environmental performance (Mahran & Elamer, 2024), sustainability performance (Venugopal et al., 2023), EI (Arena et al., 2018; Khanchel et al., 2023; Sun et al., 2021), environmental disclosure (Mahran & Elamer, 2024), environmental practices (Chassé & Courrent, 2018), environmental responsibility (Pelster & Schaltegger, 2022) and how to see and take advantage of environmental opportunities for the company (Leonelli et al., 2022).

Institutional theory

The second theory used is the institutional theory which emphasises the informal understandings and cognitive frameworks that shape the social structure of markets. The three pillars of the institution, namely the regulatory, normative, and cognitive cultural pillars, are the three elements that social theorists consider vital to the institution (DiMaggio & Powell, 1991).

7 articles of 24 use this theory comprehensively or sharing the perspective with another. The study by Friedrich & Wüstenhagen (2017) combines institutional theory with the psychology theory of grief. It builds a model of grief phases to explain why firms need time to adapt to institutional changes, e.g., changes in renewable energy policies. This study aims to inspire, among other things, long-term thinking on sustainability issues. Hoogendoorn et at. (2019) focus on the more institutional part of entrepreneurship, i.e., when a person or group of people work to change an institution drastically. Other studies explore what are the differences between sustainable and non-sustainable leading entrepreneurs (mostly in terms of EI) and how this is affected by the normative pillar of institutional theory (Ben Amara & Chen, 2022), and both normative and regulatory pillar as mooring factor to green entrepreneurship (Ye et al., 2020). Other topics that are explored are how power works in leaders when it comes to improving environmental performance (Walls & Berrone, 2017), how the concept of faith intersects in these leaders who want to lead the company towards environmental objectives, or what types of motivations make them more aligned with sustainability (Martinez, 2019).

Other theories

Strategic management could include some different theories or approaches. Regarding agency theory, Lin et al. (2022) conclude that managers' agency narcissism and hubris positively affect the company's sustainable development. This research strengthens the literature on how CEO personality traits influence the relationship between CS practices and enterprise performance. Furthermore, the combination of leader-member exchange theory and contingency theory is applied in the Agyabeng-Mensah et al. (2023) study, where the former theory is used to explain the relationship between sustainable chain ethical leadership and circular sustainable chain practices, while the latter one addresses the moderation between environmental orientation and sustainable chain practices on sustainable performance. The study concludes that a sustainable chain ethical leadership coupled with circular sustainable chain practices and an environmental orientation improve sustainable performance.

Another approach widely used in management, and which only appears in one of our articles (García-Sánchez et al., 2021) is the resource and capabilities-based theory (Barney, 1991; Wernerfelt, 1995). García-Sánchez et al. (2021), use the resource and capabilities-based theory to conclude that more independent and knowledgeable managers can achieve environmental strategies. Tiberius et al. (2021) explore microfoundations related to dynamic capabilities and conclude that sustainability's social dimension is related to an innovative mindset, investment in human capital and active participation in decision-making. However, they do not find a relationship with the environmental part of sustainability.

Finally, we find three other approaches in our literature review, the sensemaking theory (Daft & Weick, 1984) and two more recent ones, the positive organization scholarship theory (Cameron et al., 2003) and the sustainable strategy management (Stead & Stead, 2000) theories. The sensemaking theory is applied in various studies (Hahn et al., 2014; Tang et al., 2018), considering two different "business case" or "paradox" cognitive frame. These studies show which framework the leader interprets through the three stages

of the sensemaking process: managerial scanning, interpreting, and responding to sustainability issues. The positive organization scholarship theory is used by the study by Walls et al. (2021) who analyse how positive deviance can serve as inspiration for leaders pursuing sustainability, defining different leadership styles such as servant leadership, transformational leadership, and ethical leadership. Lastly, the article by Rego et al. (2017) explores the different discourses CEOs have around the definition of CS. It searches for what an integrative approach within sustainability means to them. They conclude that this approach is challenging to realistically put into practice since, in a globalised world and in many cases unsophisticated in innovation, it is difficult for managers to embrace this integrative perspective of the three dimensions: economic, environmental, and social concerns (Hahn et al., 2014).

1.4.1.3 Other perspectives

In this section, we group two theories from other scientific disciplines: the structuration theory (sociology), and the experiential learning theory (education).

The study by Koistinen et al. (2022) examines leaders' power and agency towards the CE transition and conclude that while the leaders are perceived as having maximum power in the firm, structural constraints often limit their agency where different levels must be managed. On the other hand, the study by Haney et al. (2020) analyses the soft side of sustainability competencies, more within the personal dimension, values, motivations, and ethics. They conclude that in experiential programs for sustainability learning, the emotional aspects must be incorporated to link to the individual's connection to the learning.

1.4.1.4 Combining theories to understand the leaders' role

By harnessing the potential of the above theories and combining them, we can gain a comprehensive understanding of how leaders can overcome barriers and promote the transition to the CE. This approach opens a world of possibilities and can lead to significant advancements in sustainable leadership.

The first combination is cognitive categorisation theory (psychology) and sensemaking perspective (management). The former explores how leaders perceive and organise information and the latter how they interpret and respond. The join will help manage tensions between the "business case" and "paradoxes" (such as collaboration and competition), which is fundamental for adopting CE strategies (Hanh et al., 2014). Second, by connecting the psychological ownership theory (psychology) with resource and capabilities-based theory (management), leaders can channel their resources and skills towards practices that drive sustainability—implying the leader's commitment to strategic advantage for the organisation. The third combination, social comparison theory (psychology) and institutional theory (management), sheds light on the crucial role of leaders' personal and contextual influences in guiding decisions towards sustainability. Finally, the theory of planned behaviour (psychology) and the upper echelon theory (management) highlight the importance of leaders' sustainability intentions and the degree of discretion they have in their roles.

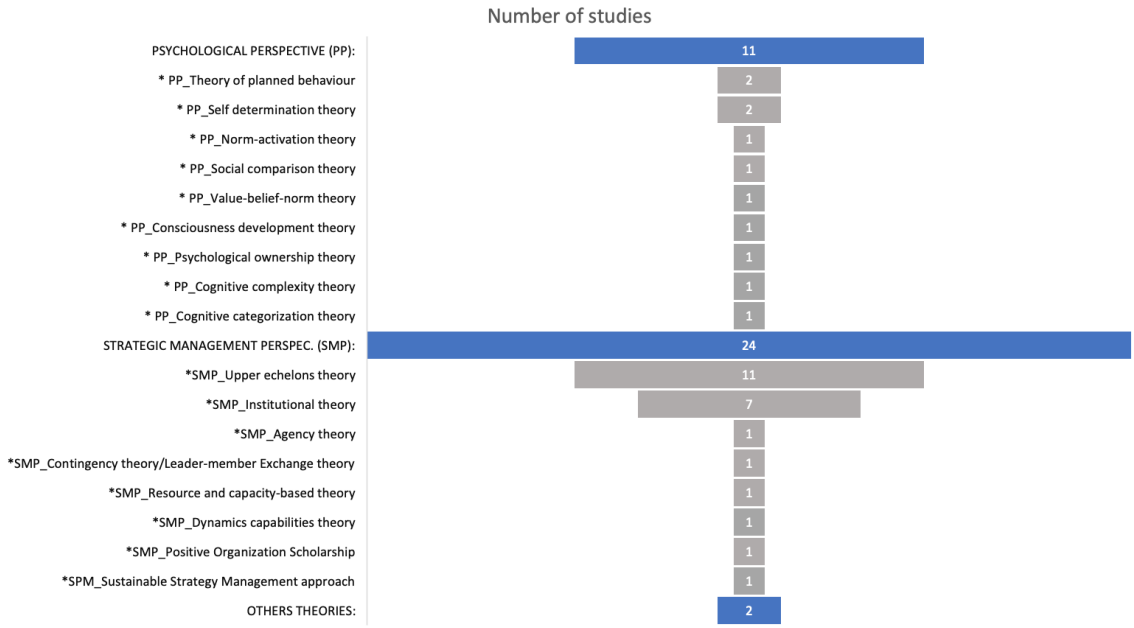

Figure 5. Perspective and theories.

1.4.2. Portrait of (SME) eco-innovative leaders focused on CS and CE

In this section, we analyse the literature found regarding microfoundations, divided into three groups of studies: motivational drivers, managerial cognition, personality traits, and leadership styles into five groups: ethical, transformation, environmental and sustainability, charismatic and distributed leadership. See Figure 6.

1.4.2.1 Motivational driver

If we look at the motivational drivers (instrumental, relational, and moral) that guide leaders to adopt CE, the literature presents leaders who are fundamentally motivated by achieving enterprises' performance and business growth (Ben Amara & Chen, 2022; Chassé & Courrent, 2018; Tiberius et al., 2021). The traditional mindset is tough to change in family businesses, and the economic goals ultimately drives these leaders (Tiberius et al., 2021). If we compare the motivation that drives them towards a more environmental or social behaviour, Chassé & Courrent (2018) argue the separation between the two above: the more social aspect may be driven by the emotional factors and the environmental one by the market and the organizational environment. Ben Amara & Chen (2022) add a new instrumental motivation: regulation. Thinking in economic and financial terms, regulation is an essential driver for adopting CE as investing in regulation will compensate the cost of compliance (reducing pollution). Thus, specific emotional internal factors showed by the leaders interacts with external factors on the adoption of CE practices.

Regarding the moral drivers, we have observed several studies showing the importance of values when carrying out CE (Cheffi et al., 2023; Haney et al., 2020; Herbert

et al., 2023; Yamoah et al., 2022). From values that are embedded in the type of leadership (e.g., ethical values such as fairness and reliability (Cheffi et al., 2023) to more concrete values such as "bigger-than-self" (Herbert et al., 2023) or "softer" values (soft side of sustainability competencies: values) (Haney et al., 2020). In the study by Yamoah et al. (2022), we see how both moral and relational drivers intersect and how values can influence or deter the commitment of different stakeholders to implement circularity.

1.4.2.2 Managerial cognition

From the cognitive frame, a perception of the world is shaped by an individual's experiences – background, education, work, the companies one has been part of, the individuals encountered, and the projects engaged in – all these experiences form a collection of knowledge that shapes the perspective. A paradoxical cognitive frame hints at providing "superior business contributions to sustainable development" (Hahn et al., 2014, p. 237). In contrast to a business case frame, it aims to harmonise business risks, encompassing operational, ecological, and societal considerations, with financial goals. Neither concludes by opting for one of these frames in which managers gamble on this adoption. Hahn et al. (2014) conclude that both frames could fit this profile, as the authors consider sustainability a complex issue and do not advocate simplifying it into just one frame. However, Murcia & Acosta (2022) opt for an intermediate frame between the two frames proposed by Hahn et al. (2014). Martinez (2019) adopts a more spiritual approach, highlighting faith as a development process where we reaffirm our actions preserving the ability to accept or reject our principles. The study concludes that the higher the level of faith and spirituality of the leaders, the easier it is to reject activities that are not sustainable.

Other aspects of cognition that influence CE are the feelings of the leaders. Feelings are the mental representation of the physiological changes that characterise emotions (Damasio, 2001). Two studies inquire about two contrasting feelings. The first concludes that concern in leaders causes them to act on EI issues; it moderates EI to translate it into company performance (Tang et al., 2018). The second study considers the positive sense of psychological ownership, the feeling of possession over a target, that formal ownership may or may not support. Psychological ownership is found to be an essential precondition for managers to be part of the transition and become creative and autonomous thinkers (Kurki & Lähdesmäki, 2023).

Two other elements regarding managerial cognition are experience and cognitive complexity. Experience shapes how leaders process information and acts as a mental filter mechanism (Salaiz et al., 2021). Boira et al. (2018), focus on the role of the manager's awareness and states of consciousness, concluding that they do not depend on the company's environment but on personal experience, history, and frame of reference. So, the higher the level of awareness, the more environmental commitment. Finally, regarding mental complexity, Gröschl et al. (2019) conclude that low cognitive complexity of the leader represents a significant impediment to achieving proactivity in sustainability issues.

1.4.2.3 Personality traits

Some studies evaluate leaders' personality traits and development to build these traits into skills and sustainability (Walls et al., 2021). There are two differentiated streams:

the first concerns more negative personality traits such as narcissism, hubris, and the dark triad (machiavellianism, narcissism and psychopathy) and the second stream focus more on positive traits. On many occasions, narcissism, and hubris are confused by the simple fact that both have the effect of excessive self-esteem. However, narcissists tend to want to maintain a very favourable image and receive continuous public attention. Hubris tends not to consider the opinions of others but to continuously satisfy their high level of self-affirmation (Lin et al., 2022). If we focus on EI, Arena et al. (2018) show the relationship between a leader's hubris and EI. In the same way a leader's narcissism is influenced by international experience and age to adopt EI (Khanchel et al., 2023).

In the field of CS narcissism positively affects the company's sustainability (Leonelli et al., 2022) and leaders with hubris and narcissism traits influence sustainable practices and corporate performance (Lin et al., 2022). Pelster & Schaltegger (2022) show that considering these traits when hiring middle managers for sustainability objectives can benefit the company. However, two studies show a negative relationship. Zhang et al. (2020) deduces that the more hubris in the SMEs leaders, the less performance towards combating a pollution effect. Venugopal et al. (2023) conclude that the shareholders' power acts as a moderating variable to lower the negative impact of neurotic leaders towards CS.

Regarding positive traits, the humble trait is highlighted in two studies (Sun et al., 2021; Walls et al., 2021). Walls et al. (2021) introduce optimism and consciousness, and conflict is seen as an opportunity for the leaders. Koistinen et al. (2022) also highlight the characteristics of pioneering, competitiveness, problem-solving, and resilience. A less recent study also highlighted certain aspects that complement the above: being caring, a holistic mindset, an open mind, empathy, and courage (Visser & Courtice, 2011).

1.4.2.4 Leadership style to CS, CE and EI

Although microfoundations analysis does not contemplate leadership style, we consider it relevant to add this perspective after reviewing the literature. Microfoundations analyse leaders towards the external – society – or towards the more internal – the more micro (Walls et al., 2021), while the leadership style has to do with the people who follow them. We found ethical leadership, which is portrayed as inspirational, stimulating and visionary, focusing more on integrity and ethical conduct in their personal and professional lives (Agyabeng et al., 2023; Cheffi et al., 2023). Several studies state how this leadership style can affect the motivation of employees towards sustainability along with their average environmental behaviour and the increase in the autonomy of employees' sustainable actions (Grave et al., 2013; Robertson & Barling, 2013). Environmental leadership is also considered the prerequisite for a CS (Boira et al., 2018) and sustainability leadership is seen as an inspirational, visionary, and value-driven style (Haney et al., 2020; Wall et al., 2021). Finally, we identified additional leadership styles. One is the charismatic style of leadership, which operates according to its own norms as noted by Papagiannakis & Lioukas (2018). The other is the distributed leadership style, as identified by Soni et al. (2023), which promotes collaborative behaviour among team members. This collaborative behaviour is considered critical for the success of CE activities.

Venugopal et al. (2023) provide a novel vision that brings precious information. This study shows parallelism between the personality trait and the type of leadership and

describes its relationship with sustainable goals. They find some traits that have a positive relationship with CS performance: Agreeableness, Openness, Assertiveness, Enthusiasm and Conscientiousness. Agreeableness is a trait that is fundamentally altruistic and very focused on the welfare of others. Openness to experience is an intellectually curious, reflective, and creative trait. It has the quality of adapting to different situations and dynamically solving tasks. This type of leadership would be effective and has the emotional component of transformational leadership. Assertiveness and enthusiasm are the two characteristics that stand out in this trait. Conscientiousness means excellent discipline, work and effort and leaders with this trait follow rules and strategies that need a detailed plan and adhere their company to regulation norms with responsibility. However, Neuroticism has a negative relationship with CS. Individual tendency towards negative emotions, such as anxiety, embarrassment, anger, and irritability inhibit any leadership tools, such as motivating and convincing people (Tenzer & Pudelko, 2015).

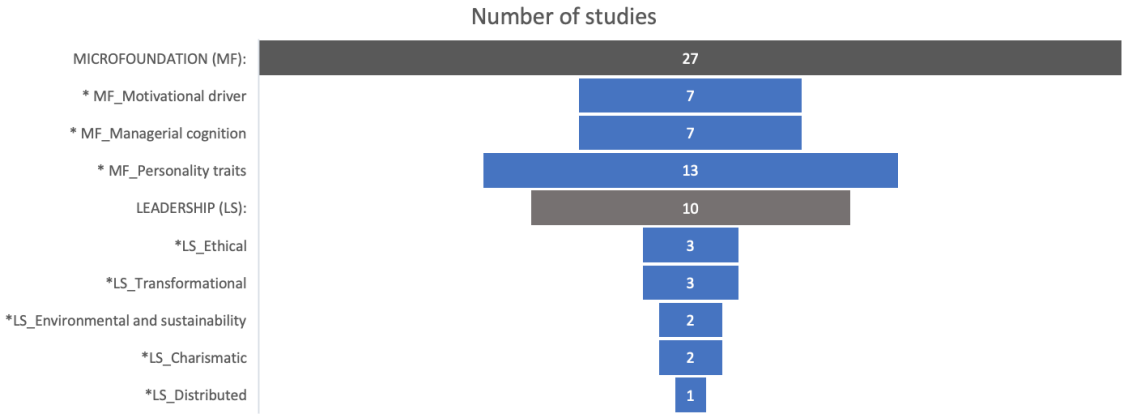

Figure 6. Microfoundations and leadership

1.5 Discussion and conclusions

The systematic review presented in this chapter has shown that the literature needs to focus more on two aspects of microfoundations research on sustainability, CE and EI: the cognitive and the affective process (such as emotions). The latter is likely due to the empirical difficulties and need for theoretical support researchers face when make a deep exploration of the leader's psyche. Since studies attempting to identify a psychological portray of these leaders use different theories in individual analyses, it is challenging to build a consistent theoretical framework. Moreover, the existing literature only measures one characteristic of the leader rather than a combination of them, which makes the analysis insufficient to get a realistic picture of what they are like.

Theories

Starting with the analysis of the different theories used from the management domain, it is shown the relevance of upper echelons theory in recent microfoundations studies. This result is aligned with Salaiz et al. (2021) and with studies that analyse

behavioural strategy and how the socio-cognitive aspects of leaders affect the firm-level outcome (Abatecola & Cristofaro, 2019; Walls & Berrone, 2017; Walls et al., 2021). Among all the studies included in the review, only 8 of them are published after 2020 but the current trend is still to use this theory. However, upper echelons theory has been criticised because it establishes proxies (e.g., tenure) to measure different psychological constructs (e.g., power or expertise) and, in some cases, these proxies would need to be more consistent (Neely et al., 2020). Therefore, it is suggested that the use of alternative perspectives that not consider only a unique leaders' influence on the company performance will be more appropriate in further research. The institutional theory is the next most applied theory in terms of the number of articles. Most of them were published before 2020, but this approach is only included in some studies (i.e., (Salaiz et al.,2021)). However, institutional theory is required in the analysis, mainly due to the influence of regulation on decisions about CE or EI. Effectively, regulation changes are seen as an opportunity for green entrepreneurs (Ben Amara & Chen, 2022; Hoogendoorn et al., 2019; Ye et al., 2020) as policy changes related to climate mitigation or pollution taxes may affect many companies (Friedrich & Wüstenhagen, 2017; Zhang et al., 2020). Therefore, exploring these individual characteristics of leaders can help indicate how companies could do better.

The rest of studies are very diverse and related with different theories and approaches. In contrast to studies devoted to analysing the different perspectives used for microfoundations towards sustainability (Salaiz et al., 2021; Sun et al., 2021), the stakeholder theory does not explicitly appear in our review. However, some elements of stakeholder perspective seem to emerge in three articles published after 2022 which can indicate that it may begin to be applied (Agyabeng-Mensah et al., 2023; Kurki & Lähdesmäki, 2023; Yamoah et al., 2022). From our perspective, the literature on leaders and CE must open to other alternative theories. In particular, the adoption of stakeholder theory could give a new vision of the value chain, customers or communities. The social entrepreneurship literature is also emerging as an alternative framework. If the "post heroic" leadership paradigm is essential because it enables to emphasise the relational, collectivist and participative nature of leadership (Manjon et al., 2022; Teasdale et al., 2023), this approach could be useful. This leader could have the ability to bounce back and relies on teamwork with other members. They are encouraged to embody servant and shared leadership behaviours, fostering the psychological well-being of their team (Škerlavaj, 2022). However, based in our review, there is a need to find a leader with heroic characteristics (Rego et al., 2017; Walls et al., 2021). On the contrary direction, managerial discretion would denote the cohesive, logical, and unified decisions made by leaders to drive the organization's development, which would be clearly connected with upper echelons theory arguments mentioned above but not with social entrepreneurship or similar perspectives.

Perhaps these hero leaders should be able to combine their leadership with other managers' and employees' pleas in their organizations (Soni et al., 2023). It will be possible to build a network and relationships that support the goal towards CE using soft skills, such as embracing paradox and negotiation skills (Walls et al., 2021). This conception moves away from the single focus on an individual with exceptional characteristics, which has much to do with the upper echelons' theory. It is closer to a leader who interacts with his stakeholders, so a stakeholder theory approach could be applied.

From a psychological perspective, the main theories used in our review contain elements such as values, beliefs, motivation, cognition, and individual behaviours that help us unveil the personality of leaders. The characteristics of leaders, particularly personality traits, are likely to be stable patterns of behaviour and cognition that emerge as responses to stimuli in human environments over evolutionary periods (DeYoung, 2014) and toward sustainability (Walls et al., 2021). Integrating different psychology and management theories within the broad fields of sustainability and leader characteristics is useful. In line with DellaVigna (2009), it is needed to integrate economics decisions and leadership. Following Hahn et al. (2014) and Boiral et al. (2018), there is a more cognitive part of the leader-the experience and level of awareness- influencing the decision making or commitment of the leader towards the sustainability. This justifies the use of the sensemaking theory is used in several studies in our review (Hahn et al., 2014; Tang et al., 2018). Therefore, it is considered that this approach facilitates the inclusion of psychological dimension in at least one of the three stages of the sensemaking process: scanning, interpreting, and identifying and evaluating the action.

Microfoundations

Regard to microfoundations, relational motivators only appear in a single article in our review. Again, stakeholder theory has not yet emerged as a theoretical framework in any article. This result differs from the study of Salaiz et al. (2021), where the stakeholder theory is one of the most applied theories in their review articles. Regarding the other two motivational articles, the articles focused on what makes the leader move from values and economic reasons to get involved in sustainability are published after 2020, which indicates that this type of microfoundations studies, instrumental and moral, is in trend.

Respect to managerial cognition and cognitive complexity, the relationship between personal development and the cognitive complexity of the leader is shown in the context of adopting the CE. This review highlights the relevance of knowledge and personal development of a leader himself. This personal growth reveals that they have concerns beyond running a business. This characteristic is typical of leaders with sustainability concerns compared to other leaders without such awareness. In this line, we emphasise the conclusion of Hay et al. (2010), where this leader is seen as an agent of change, which urges them to carry out a profound reflection with a commitment far above what is asked of the rest. Our findings lead us to consider that the union between high cognitive complexity and the leader's personal development helps achieve proactivity in sustainability issues (Gröschl et al., 2019). This personal development can also be seen as a high level of consciousness or spirituality, which makes them ask themselves questions about their commitment to the world or how they can improve the world (Boiral et al., 2018; Martinez, 2019).

Focusing on personality traits of the firm leaders there are two trends, one that is more oriented to negative traits, "dark-side", such as narcissism, hubris, overconfidence and arrogance (Arena et al., 2018; Leonelli et al., 2022; Lin et al., 2022; Pelster & Schaltegger, 2022), and another where traits are more oriented to the optimistic, extraversion, humbleness or open mindedness, "bright-side" (Koistinen et al., 2022; Sun et al., 2021; Venugopal et al., 2023; Visser & Courtice, 2011; Walls et al., 2021; Zhang et al., 2020).

Within the literature on negative traits and specifically narcissistic traits, we can differentiate between vulnerable and grandiloquent narcissists. The latter is people with high self-esteem and interpersonal dominance, but the vulnerable narcissist acts in a more defensive, avoidant, and hypersensitive way. According to Khanchel et al. (2023), the vulnerable leaders are not encouraged to implement EI because they are too sensitive to accept failure and take responsibility. The grandiloquent may be motivated to develop CE because this gives him a good image and reputation, gaining recognition among his followers. The lack of consensus on this trait likely has to do with this nuance within the trait itself and would require further research.

1.5.1 Theoretical implications

This study identifies the two most prominent theoretical approaches used in the identified literature to understand the role of the leader in the CE context: the strategic management and the psychological perspective. However, these theoretical propositions are derived from piecemeal and individual explanations based on diverse streams. This lack of theoretical integration explains why this research has attempted to achieve a more integrated theoretical framework than the previous ones to serve as a reference.

In this regard, it is found that the upper echelons theory proposed by Hambrick & Mason (1984) is the main approach to study the role of leaders in the transition to a more sustainable and CE. This theory focuses on top-level executives and how their individual characteristics impact strategic decisions and organizational performance. Nevertheless, it cannot be that this vision is valid for leaders of companies with different sustainability concerns, especially for those that show a clear commitment to the CE. The same dress does not fit everyone. In the context of CE transition, the idiosyncratic characteristics (such as cognitive base and values) of executives influence strategic decisions and organizational outcomes to carry the challenges from linear to CE. However, the problem is that this theory only glimpses, based on a leadership perspective, the consequences of a unique dimension (the leadership) on the level of the firms' circularity of the company. The complexity of firms adopting CE-related innovations (a type of EIs) and other CE practices requires the integration of different theories.

Along with the upper echelon theory, it is necessary to consider the institutional theory because the normative and regulatory framework is essential to achieve CE transition. Therefore, integrating institutional theory related to regulation and social norms with the upper echelons' theory could provide a more comprehensive understanding of how institutions affect organizations and leadership decisions to adopt CE principles. In addition, the stakeholder perspective is also crucial to contemplate the relationships with interested parties (such as customers and suppliers). By integrating these three theories, we are broadening the perspective of this leader by considering diverse angles of the relationship between leader and CE transition.

In relation to the psychological perspective, the combination of management and psyche characteristics of leaders could enhance our understanding of how they make business decisions considering the cognitive dimension. Based on this premise, it is advisable to make a continued effort to integrate psychological theories with more purely business-oriented theories. As it is argued by Hahn et al. (2014), the cognitive categorization

theory combined with sensemaking theory can contribute to disentangling the entire cognitive process of leaders when making decisions related to the design of CS. In this sense, we propose the integration of both perspectives (cognitive and sensemaking) to enhance outcomes in business circularity, delving into various aspects of leadership: beliefs, motivations, cognition, and behaviour. On the other hand, our review reveals that behavioural theories are predominantly used, but understanding cognitive processes—precursors to behaviour—would provide further knowledge and insights into leaders' circular performance.

On other hand, the two archetypes[2] of leaders who promote and are committed to CE within their organizations are identified. The first archetype is a person with a dark trial personality trait, i.e., narcissism or arrogance. Within these traits, we focus on the more grandiloquent part, discarding the vulnerable, where any behaviour that brings him closer to sustainability and specifically to CE will bring him prestige, improve his image, and contribute to a reputation within the company (Khanchel et al., 2023). Moreover, these leaders are not concerned about social or environmental issues (Pelster & Schaltegger, 2022) but about company performance. The latter gives us a clue that their cognitive frame will be more focused on a "business case", i.e., their motivation will be in pursuing economic objectives (Lin et al., 2022) and less on the environment and people impacts. They are control-oriented leaders regarding sustainability (Leonelli et al., 2022). They need to be more friendly to delegate, and hence, their leadership is of the charismatic type, where they act according to their rules (Papagiannakis & Lioukas, 2018). In addition, these people have a unique ability to attract external investors, which significantly facilitates the advancement of the sustainability project in the company (Lin et al., 2022). When exploring this archetype, it is best to work under the theoretical framework of the upper echelons' theory.

The second archetype is focused on more positive personality traits, which the literature calls the "bright-side". Humility is the most essential trait of this type of leader (Sun et al., 2021; Visser & Courtice, 2011; Walls et al., 2021). The most prominent components of this personality trait are self-awareness and acceptance of one's limitations and involve self-transcendence and world focus (Boiral et al., 2018; Sun et al., 2021; Visser & Courtice, 2011). These two characteristics bring us to managerial cognition; on the one hand, the knowledge and personal development of these leaders unveil a high cognitive complexity that makes them self-aware persons with the ability to understand their limitations and those of others (Gröschl et al., 2019; Visser & Courtice, 2011). On the other hand, as cognitive frames are within the paradoxical (Visser & Courtice, 2011; Walls et al., 2021), they are leaders who embrace paradox to feel more righteous in their decisions and courageous and resilient enough to address it. Their leadership type is identified with transformational, inspirational, and motivational leadership (Eide et al., 2020; Grave et al., 2013), and ethical leadership, which emphasised socially responsible behaviour (Agyabeng-Mensah et al., 2023; Cheffi et al., 2023; Robertson & Barling, 2013). This type of archetype is analysed using psychological perspectives (combining them with managerial ones) e.g., institutional theory (Grave et al., 2013; Gröschl et al., 2019; Walls et al., 2021). In short, we agree with Walls et al. (2021) that if we had to name this archetype, it would be a heroic leader. This term emphasizes the more authenticity-seeking part and the ability to face

[2] Archetypes are archaic collective unconscious contents (Jung, 2004). From the Jungian perspective, the archetype is an abstract pattern, not certain symbolic representations, which depend on each culture.

challenges to achieve collective goals, characteristics that are undoubtedly necessary to overcome the barriers to EI for the transition to a more sustainable and CE.

1.5.2 Future research

Two key areas warrant further investigation. First, the relational motivators under the microfoundations lens. This will help us understand how leaders interact with the different stakeholders' groups. It will also allow us to use this theory to deeply understand CE leaders' characteristics. Second, the barriers these leaders face need further exploration. Since archetypes 1 and 2 could do a different interpretation of these barriers and give a distinct response, it could interest to investigate them distinguishing between both leader's types[3].

Theories of emotions with SME leaders' CE and EI are also lacking. Therefore, it is needed to study the relationship between emotions of these leaders and how these emotions lead to action and sustainability initiatives[4]. This highlights the importance of taking critical lens to the field of leadership and adapt it to the context of CE. It is essential to broaden our understanding of what are the characteristics of the business leaders, what do they do and how do they do it (Vera et al., 2022) to bridge the micro (leadership) and the micro, meso and macro (circularity dimensions). Indeed, we are committed that if we move forward on this path, we will achieve easily to shift the economy toward a sustainable, and inclusive future.

[3] In Chapters 2 and 3, we will further explore the gap that we have shown regarding the barriers in this systematic review.

[4] This will be explored in Chapter 3.

Chapter 2. Breaking down barriers: The adoption of eco-innovation by SMEs and the influence of personality traits

"Character, in the long run, is the decisive factor in the life of an individual and of nations alike"
(Theodore Roosevelt, 1900)

2.1 Introduction

Considering the social and environmental crisis, the role played by small and medium enterprises (SMEs) is paramount. SMEs cause approximately 70% of the total global pollution (Bakos et al., 2020; García-Quevedo et al., 2020). The OECD (2022) states that SMEs and their leaders constitute the backbones of leading developed economies and ensure a sustainable, cleaner, and more inclusive pathway to growth. SME leaders address environmental challenges through eco-innovation (EI) (Bossle et al., 2016; Redmond et al., 2008; Urbinati et al., 2017). Thus, leaders are key for firms' adoption of EI (Arena et al., 2018; Salaiz et al., 2021; Sun et al., 2021; Zhang et al., 2020).

Unfortunately, the adoption of EI by SMEs faces several barriers related to technology, finance, regulation, and market demand (Ghisetti et al., 2017; Gupta & Barua, 2018; Jabbour et al., 2018; Murillo-Luna et al., 2011). Previous studies have identified and proposed the use of various barrier taxonomies to distinguish internal and external barriers, and the diverse obstacles faced depending on the type, novelty and maturation stage of EI (Arranz et al., 2019; Caldera et al., 2019; Gupta & Barua, 2018; Jabbour et al., 2018; Polzin et al., 2016). However, these potential barriers are generally conceived as an independent list of the characteristics of SMEs' objectives, concreteness and immutability (Hudson & Ozanne, 1988). The barriers to adopting EIs are explored as distinct from their general context (Bakos et al., 2020) and, more specifically, as disconnected from the roles of leaders.

Identifying these barriers has inspired the emergence of an increasing body of literature on internal firm factors that facilitate transcending the barriers to EI adoption (Aboelmaged & Hashem, 2019; Salaiz et al., 2021). These internal factors refer to the organizational features that facilitate the adoption of EI (Hojnik & Ruzzier, 2016). Among these studies, a few (Bossle et al., 2016) highlight the role of leaders as a significant internal factor in the adoption of EI by SMEs. Some examples of this include affective drivers or personality traits (Arena et al., 2018; Hrazdil et al., 2021; Walls et al., 2021).

Despite this growing interest in studying the barriers to EI, there are still two under researched aspects in this field. First, these barriers may be subject to interpretation by SME leaders (Bakos et al., 2020; Marin et al., 2015). For example, a leader who is open to new experiences (openness) sees a lack of funding as a creative opportunity, while a less open leader perceives it as a threat and exhibits resistance to change. In the sensemaking process, leaders create a frame for interpreting a situation and taking action (Gioia & Chittipedi, 1991; Hahn et al., 2014). We argue that there is an array of leader personality traits that determine the interpretation of the barriers that arise to EI. Second, most previous studies have focused on these traits separately and unidirectionally (Petrenko et al., 2016; Sun et al., 2021; Zhang et al., 2020). Thus, we propose that such leader traits cannot be isolated from each other (Hirsh, 2010; Hrazdil et al., 2021). For example, an open and responsible leader sees regulatory changes as opportunities, acting efficiently and in a timely manner. However, another leader who is open but lacks responsibility might take on such a task but miss deadlines due to poor time management. Therefore, the research gap examined in this

chapter concerns the relationship between leaders' personality trait combinations and the barriers to EI that need to be overcome. "If leaders can drive business transformation for sustainability, then it is important to uncover how individual-level psychological traits" operate to foster EI (Walls et al., 2021, p. 2) and to analyse the sensemaking process through which leaders interpret the barriers to EI and take action in the form of EI adoption (Gioia et al., 1991).

To advance the understanding of the drivers of EI adoption in SMEs (Bossle et al., 2016; Hojnik & Ruzzier, 2016; Salaiz et al., 2021), we focus on the reconfigurations of diverse personality traits that can overcome EI barriers. Furthermore, we explore the influence of leader personality traits on EI adoption in the managerial decision-making literature (Gond et al., 2017; Hafenbrädl & Waeger, 2017; Salaiz et al., 2021; Walls et al., 2021). Considering the significance of complex managerial motivations to the integration of environmental sustainability into innovation, in this chapter we address this question: Are there specific combinations of leader personality traits and barriers to adopting EI?

Therefore, this chapter contributes to the literature on the barriers to EI and on the personality traits of the microfoundations (in this case, leaders) involved in EI adoption. The first contribution made involves a novel conceptualization of EI barriers from the perspective of leader interpretations. This approach allows us to delve into the complex relationship between EI barriers and leader motivations through the lens of sensemaking. The second contribution is revealing that examining a joint configuration of personality traits provides more insight into the drivers of EI than examining the individual effect of isolated leader personality traits. Finally, this research offers a methodological contribution to the identification of leader personalities based on configurational theory rather than on traditional statistical methods (e.g., regression and structural equation modeling) (Ou et al., 2015; Petrenko et al., 2016). Moreover, this methodology is seldom used in studies based on psychological microfoundations (Gond et al., 2017; Hafenbrädl & Waeger, 2017; Walls et al., 2021). Therefore, we hope that a configuration of various traits provides additional information to help uncover how and why some leaders can overcome the tension posed by these barriers and facilitate EI (Walls et al., 2021). In this regard, we posit that the qualitative approach based on configurational theory that is used in this study has the capacity to identify the explanatory factors and complex interdependencies among the internal drivers, mainly linking these factors to leader characteristics in the process of making sense of their environments (external factors) and formulating strategies for adopting EI.

Hence, to achieve our research objectives, we empirically analyse the personality traits of 40 leaders from Spanish SMEs involved in EI. Based on an original semi structured personal interview, our aim is to identify the perceived barriers that had to be overcome to pursue EI, as well as the intensity and type of EI that was conducted. The responses of these leaders enabled us to apply fuzzy-set qualitative comparative analysis (fsQCA) to analyse the influence of personality traits given the sample size and research objectives of this study. Rather than considering personal traits in isolation, fsQCA can be used to identify how the personality traits of leaders and EI barriers combine to achieve a high or low level of EI adoption (Fiss, 2011).

The remainder of this chapter is organised as follows. First, it explains the conceptual framework and propositions (section 2.2). Section 2.3 is dedicated to the research methodology, interviews, and data collection procedures. Section 2.4 presents the data analysis and results. Finally, section 2.5 concludes the paper by offering a discussion, theoretical and methodological contributions, and practical implications. Limitations and research avenues will be discussed in section 4.3, chapter 4 of the thesis.

2.2 Theoretical background and propositions

2.2.1 Barriers and EI

Authors have examined the barriers that can hinder the adoption of EI by firms (Bakos et al., 2020; Ghisetti et al., 2017; Gupta & Barua, 2018; Marin et al., 2015). Most of these studies identify and classify the types of EI barriers that need to be addressed (Arranz et al., 2019; Caldera et al., 2019; Gupta & Barua, 2018; Jabbour et al., 2018; Polzin et al., 2016). First, a distinction is made between internal and external barriers. Thus, the perception of the risk of high cost due to a lack of knowledge and the uncertainty of demand for EI goods and services have been identified as internal barriers (Arranz et al., 2019). On the other hand, the insufficiency of financial resources for accessing the required knowledge and the time lag needed to accomplish environmental regulations have been identified as external barriers (Triguero et al., 2013), and coercive pressure (through policies and regulations), normative pressure (from the market) and mimetic pressure (from competitors) have also been identified as external barriers to EI (Cai & Li, 2018).

Second, these barriers are classified according to EI type (product, process or system), EI novelty (radical or incremental) and the stage of EI technological diffusion (mature or immature). Environmental resources, attitudes and perceptions, business practices, a lack of government support, and customer demand are the main barriers to pursuing EI. Moreover, poor external partnerships and insufficient information are more critical barriers to the innovation process. Furthermore, technical barriers, insufficient information, a lack of government support and commercial environmental benefits are the corresponding for the EI system (Abdullah et al., 2016). Because incremental EI introduces relatively minor changes compared with radical EI, financial restraints and uncertainty in the demand market have been identified as specific barriers to incremental EI, while factors such as technological path dependency or a lack of skilled human resources have been considered more relevant to radical EI (Kiefer et al., 2019; Marin et al., 2015). Finally, the barriers to EI can vary depending on the maturation stage of the EI process. In this sense, supply, demand and regulatory conditions are important obstacles due to the high levels of risk and uncertainty in the early phases (Triguero et al. 2013), while the need for financial and human resources and the barriers that hinder the transition from pilot projects to larger-scale implementation arise at later stages (Kiefer et al., 2019).

Depending on their origin, dynamic capabilities, SME resources, and the influence of external factors such as government aid or collaboration with partners all hinder the adoption of EIs. The former denotes environmental aspects that SMEs can control, while the latter constitute barriers that cannot be controlled through resource assignment (Abdullah et al., 2016; Murillo-Luna et al., 2011; Redmond et al., 2008). However, only

some studies additionally delve into the combination of these barriers in the pursuit of EI adoption (Marin et al., 2015; Polzin et al., 2016).

A few barriers, such as insufficient consumer demand, governmental support or commercial benefits, are common. However, they are considered a list of obstacles without the consideration that it is a combination of such barriers that affects the adoption of distinct types of EIs. Regardless of EI targets and outcomes, not all practices imply the same changes within companies. Therefore, various barriers emerge depending on whether the focal EI involves more significant or resource-intensive changes. Financial, customer and market constraints are perceived as barriers to redesigning products and services. Administrative and regulatory barriers are also identified by SMEs with a focus on waste reduction and renewable energy (Kiefer et al., 2019; Marin et al., 2015).

There are only a few studies that reject the notion of a single particular set of barriers to EI adoption for all SMEs (Bakos et al., 2020; Marin et al., 2015). Thus, Marin et al. (2015) classified SMEs according to the combination of types of perceived barriers. Polzin et al. (2016) also highlighted the configurations of barriers that hinder EI activity. Based on these two studies, we explore the possibility that there are varying combinations of barriers that limit EI. Therefore, we present the following proposition based on this assumption:

P1. The combination of different types of barriers operates as necessary condition for EI adoption.

2.2.2 Traits, barriers and EI

Some features that facilitate EI adoption include environmental capabilities, environmental management, human resources and environmental strategy (Arranz et al., 2019; Bossle et al., 2016). Recent studies have recognised the role played by leaders in the adoption of EI (Bossle et al., 2016; El-Kassar & Singh, 2019; Fang & Zhang, 2021; Tang et al., 2018). If the role of leaders is essential for EI, then exploring their psychological traits is necessary (Walls et al., 2021). Some leaders are more skilled at overcoming internal barriers, i.e., the obstacles related to corporate culture and knowledge, while others are more skilled at overcoming external barriers, i.e., efficient compliance with policies and legislation within the company's sustainability agenda.

According to Urbinati et al. (2017), there is an essential connection between barriers and leaders because leaders often trigger actions to implement EI. In this way, their perceptions and attitudes help them overcome internal SME barriers, such as insufficient knowledge (Redmond et al., 2008). Furthermore, their perception of stakeholder barriers results in either a proactive or non-proactive attitude toward environmental initiatives (Guoyou et al., 2013). This leader proactivity positively breaks through cultural barriers, impacts environmental issues and fosters collaboration among teams (De Medeiros et al., 2018). Additionally, the commitment of these leaders causes them to accept their legitimate responsibility for the environment and prompts them to address such barriers (Eiadat et al., 2008), for instance, to overcome the technological barriers to adopting EI (El-Kassar & Singh, 2019).

In microfoundation research, individual-level analysis, e.g., the analysis of psychological traits, is used to explain firm-level outcomes through the incorporation of interactions in the business context (Walls et al., 2021). For example, in a context of uncertainty that includes such barriers, individuals may have different opinions and ideas about what is feasible and what is not. Analysing these traits to determine how such barriers are overcome differently by leaders with different personality traits seems appropriate (Felin et al., 2015).

Studies on personality traits as EI factors typically explore isolated personality traits and are generally based on upper echelon theory, examining how a particular trait can affect the transition toward actions linked to sustainability (Arena et al., 2018; Gond & Moser, 2021; Petrenko et al., 2016; Zhang et al., 2020). Only a few EI studies apply these factors simultaneously (Hrazdil et al., 2021). Thus, the extant studies on the effect of personality traits on EI adoption focus on isolated traits. As Arena et al. (2018) highlight, leader arrogance is an individual factor that intensifies a firm's EI efforts. Another study (Zhang et al., 2020) concludes that such efforts lead to more significant pollution by the firm. Narcissism (Petrenko et al., 2016) can exert positive effects on a company's social and environmental engagement, and leader humility (Sun et al., 2021) facilitates EI activities. Against this background, we aim to broaden this perspective and outline the trait combinations needed to overcome specific barriers to EI adoption.

P2. The combination of different leader traits explains EI adoption.

The basic units that make up personality and affect individual choices are embedded in the Big Five personality traits (Costa & McCrae, 1992; Goldberg, 1999), and they are openness, conscientiousness, extraversion, agreeableness, and neuroticism (OCEAN). For instance, extroverted leaders with distinctive motivational tendencies are more likely to participate in CSR actions (Hrazdil et al., 2021). In the next section, we delve into the personality traits of leaders and the interaction of these traits with the uncertainty of EI adoption barriers, interpreting this situation (Gioia & Chittipeddi, 1991) through a sensemaking process that involves the interpretation of barriers and external dynamics (Weick, 1995).

2.2.3 Sensemaking, traits, barriers and EI

In recent decades, several organizational theories, such as expectation confirmation theory and strategic cognition theory, have explored managerial information interpretations in business decision-making processes. Among them, the sensemaking perspective is critical to organization studies (Sandberg & Tsoukas, 2015). In this regard, there are some studies that focus on sensemaking in leadership (Pye, 2005) and others that consider strategy and organizational change (Palmer & Dunford, 1996). On the one hand, leader characteristics and capacity to effectively make sense of their environments are factors that are considered in the leadership decision-making literature (Thiel et al., 2012). On the other hand, the second group of studies analyses dynamic capabilities (sensing, seizing and transforming) through strategy-as-practice (Regnér, 2015). The latter analyse the behaviour of middle management and the ways they formulate strategies for the construction of unique assets to achieve superior performance (Balogun & Johnson, 2004). Sense making and strategic cognition theory are both cognitive approaches to exploring

how people (leaders) and organizations (SMEs) interpret, understand, and respond to complex and dynamic environments. Sensemaking and strategic cognition theories share some common concepts, such as mental models, frames, schemas, and scripts, that shape how people perceive, process, and evaluate information and situations. However, they also exhibit some differences in their focus, scope, and application.

Sensemaking theory addresses how individuals and organizations interpret, understand, and respond to intricate and uncertain environments (Weick, 2001). It is based on the idea that reality is not inherent but rather constructed from the interaction of people and distinct contexts. Furthermore, this theory explores the cognitive, discursive, emotional, and embodied processes that shape how managers make sense of their experiences and how they communicate and coordinate their actions with others (Weick, 2001). According to the sensemaking approach, individuals actively select information from their environment and determine its relevance and meaning (by interpreting information in assessing the potential barriers to EI) (Weick, 1995). A given situation of one manager can be understood as highly relevant or can be completely overlooked. In our case, this relevance assignment leads to one response or the other in regard to EI issues (cf. Daft & Weick, 1984; Thomas et al., 1993, who examine the sequence of the sensemaking process). Interpretation is the scenario in which we extract meaning from signs containing ambiguity, uncertainty or complexity in enterprise issues (Hahn et al., 2014; Weich, 1995). The sensemaking approach indicates that managers' interpretations are reinforced toward action in the face of these indications.

Akin to sensemaking, strategic cognition theory is focused on the cognitive processes that influence strategic decisions and actions in organizations. Strategic cognition theory emphasises the analytical and rational aspects of strategic cognition and the ways people use models and techniques to optimise and rationalise their choices and behaviours. It also considers the antecedents and outcomes of strategic cognition, such as environmental scanning, interpretation, decision making, and performance (Balogun & Johnson, 2004). However, strategic cognition theory is more specific than sense-making theory. Sensemaking theory emphasises the social and communicative aspects of decision-making processes, including the methods by which people construct and negotiate values with others and the constraints that influence sensemaking (such as uncertainty, surprise, disruption, politics, and power), while the strategic cognitive view is focused on the strategic context. Despite the differences between these two perspectives, the sensemaking framework enables us to investigate the strategy-as-practice configuration (the adoption of EI) through manager understanding of EI barriers (Regnér, 2015; Sandberg & Tsoukas, 2015). Thus, sensemaking is related to strategic managerial cognition.

We focus on the literature that explores managerial cognition and sensemaking approaches in managing environmental and social issues in firms (Hahn et al., 2014; Thomas et al., 1993), and find that most of these studies are motivated by either the goal of identifying the dimensions of business sustainability, e.g., risk reduction or efficiency gains, and exploring the interrelationships between sustainability and managers' ability to form conceptual frameworks (Hockerts, 2015) or to explore how managerial cognition and interpretation influence the response to sustainability issues (Gröschl et al., 2019). Finally, existing studies claim that managers' cognitive frames play an important role in their perceptions of sustainability issues (Hahn et al., 2014). For example, Gioia emphasises top

management sensemaking (Gioia & Chittipeddi, 1991) by examining executive characteristics and drawing a parallel between executive interpretive systems and firm-level interpretations of new phenomena. As Hahn et al. (2014) discussed, sensemaking is not a specific automatic frame used to determine manager sensemaking but rather illuminates managers' personal, situational and contextual factors and beliefs or backgrounds that serve to moderate this sensemaking (Penttilä et al., 2020). Thus, manager characteristics (i.e., personality traits) influence how cues are recognised and translated into action within a company (Busch et al., 2020). These cues need not always be overt; moreover, the sensemaking scenario can emerge "when the current state of the world is perceived as different from the expected state of the world, or when there is no obvious way to engage with the world" (Weick et al., 2005, p. 409). Other studies also focus on discrepancy, rupture, disconfirmation, or disruption (Weick, 1995). In the current study, we consider personality traits and barriers to have the capacity to jointly interrupt the flow of EI. Based on this assumption, the following proposition is formulated:

P3. Combinations of personality traits and barriers can explain the presence of EI adoption.

2.3 Method

2.3.1 Research model and variables

This study's model for explaining EI adoption in SMEs includes two main components: the barriers to EI adoption and the personality traits of SME leaders (see Appendix 6). These two components form the conditions, and EI adoption represents the outcome. The variables for the barriers to EI are taken from the study of Gupta and Barua (2018), which covers all the barriers that we have discussed, albeit in a general way. There are seven such barriers: technological and ecological resource-related barriers (BTEC), financial and economic barriers (BFIN), management and organizational human resource-related barriers (BORG), poor external collaboration and stakeholder engagement (BCOL), a lack of government support for green initiatives (BGOV), market and customer-related barriers (BCUS), and insufficient knowledge and information on green practices (BKNO). For the personality trait variables, we follow the Mini-IPIP, which is a 20-item short form of the 50-item International Personality Item Pool-Five-Factor Model measure (Goldberg, 1999). It is used to assess the Big Five personality traits: agreeableness (AGR), conscientiousness (CON), extraversion (EXT), openness to experience (OPE), and neuroticism (NEU), and four items are used for each of these five dimensions. These barrier variables and the Mini-IPIP were measured using a 5-point Likert scale (1 to 5) to indicate the degree of disagreement/agreement, where 1 represents very unlikely, 2 represents unlikely, 3 represents neutral, 4 represents likely and 5 represents very likely. The study used the mean as a factor for each of the five traits (Donnellan et al., 2006).

To assess the outcome of EI adoption, we use the four critical dimensions of EI identified by Carrillo-Hermosilla et al. (2010) and referred to in many studies to explore the detailed characteristics of each dimension of EI: design, user, product-service, and governance (Kiefer et al., 2021). The design dimension (DSEI) stresses the relevance of the impact of EI on processes, products and organizational changes, and emphasis is placed on a reduction in both inputs (materials, energy and water) and outputs (emissions). The user

dimension (USEI) refers to company engagement in user–producer interactions, i.e., the changes that a company undertakes to anticipate the market, and the changes implemented through the creativity of users. The product-service dimension (PSEI) consists of the delivery of the product or service, and it is used to identify possible changes in customer relations through the improvement of EI, as well as changes in the value chain or in business processes. Finally, the governance dimension (GNEI) describes the stakeholders and their behaviour within the value network. We use the mean as a factor of the four dimensions for the EI construct (Carrillo et al., 2010; Kiefer et al., 2017; Kiefer et al., 2019).

2.3.2 Samples and procedure

Given the complexity of identifying this type of company, to ensure that the sample consists of eco-innovative SMEs and that it is representative, we relied on two Spanish public institutions: *Alto Comisionado Para España Nación Emprendedora*, which is the body of the Presidency of the Government, and ENISA (National Innovation Enterprise), which supports viable companies aiming to promote innovative entrepreneurship. The ENISA is a part of the Ministry of Industry. The choice of SMEs was derived through consultation with these two entities. A questionnaire was administered to 105 SME managers. Among them, 40 were valid, 27 were nonresponsive, and 38 failed to meet the number of employees and years of activity requirement. Before data collection, a questionnaire and a pilot interview were pre-tested for content validity by three experienced researchers on EI and three SMEs. Their contributions and comments were considered to refine the questions and minimise the potential bias in the questionnaire response and interview process (Creswell & Poth, 2016). Moreover, meticulous attention was given to ensuring the precision and clarity of the measurement items for easy comprehension, considering that the target group comprises SME managers who are familiar with sustainability. The anonymity and voluntary nature of respondent participation were guaranteed to mitigate potential biases such as social desirability and common method biases. The questionnaire was sent out with a brief explanation of the general purpose of the study in compliance with these criteria, and a phone call was made to explain these issues prior to the interview to enhance the validity of the responses and minimise the potential bias in our survey research.

Subsequently, the sample was reduced to 40 leaders; 37.5% of them were female, and 62.5% were male. They had all been active in SMEs for at least five years, managed at least five employees, and were located in as many Spanish locations as possible; these locations covered the rural, urban, northern, and southern areas (Table 4). Once selected, we interviewed participants to gather information on personality traits, barriers, and degrees of EI adoption and development. We found this step to be particularly important, as EI self-assessment is complicated, particularly for those less acclimated to technical issues. The interviews were recorded and transcribed, and they lasted from 40 minutes to over an hour. All the interviews were performed online aside from two interviews that were conducted face-to-face.

Table 4. Characteristics of the sample

Classification	Frequency	Percentage
Gender		
Male	25	62.5

Female	15	37.5
Age (years)		
18-25	5	12.5
26-30	12	30
31-36	10	25
Above 37	23	32.5
SME experience (years)		
0-4	5	12.5
5-10	12	30
11-20	12	30
Above 20	11	27.5
SME size (employees)		
5-20	23	57.5
21-35	6	15
36-99	7	17.5
Above 100	4	10
Sector Category		
Food	11	27.5
Clothing or other textile products	10	25
Industry	6	15
Construction	5	12.5
Consultancy	3	7.5
Logistic	2	5
Technology	2	5
Tourist	1	2.5
Geographical area		
Rural area	14	35
City area	26	65
Total	40	100%

2.3.3 Methodology

Analysing leader traits and characteristics requires a qualitative approach (Neely et al., 2020). QCA is a research approach based on Boolean algebra that is used to explore how a combination of configurations can be used to explain an outcome (Ragin, 2008). A configuration refers to a combination of conditions that are relevant to the given outcome. QCA is based on equifinality, asymmetry and conjunctural causation (Schneider & Wagemann, 2013). First, the characteristic of equifinality enables the connection of many combinations of causally relevant conditions to the same outcome, which in our case involves various combinations of personality traits—with a focus on those with the capacity for overcoming barriers—that lead to the same unique outcome (EI adoption). Second, asymmetry occurs when a configuration that leads to a particular outcome is not the opposite configuration from one that leads to a negation of that outcome. In our case, the configurations that lead to an outcome (a high level of EI) may differ from those that lead to its negation (a low level of EI). Finally, conjunctural causation, which is implicit in QCA, enables a consideration of the interactions among conditions in a phenomenon (Oana et al., 2021). QCA assumes that the influence of attributes on a specific result depends on their combination rather than on isolated individual attributes (Medina-Molina et al., 2022). Furthermore, unlike other methods, QCA does not work with independent or dependent variables; rather, it uses terms, conditions, and outcomes. Similarly, rather than stating hypotheses, working propositions are established in QCA.

This approach is well suited to this study because, with the access to leaders being very restricted (Walls et al., 2021), a qualitative methodology allows us to keep the number

of samples small and to examine the relationship between the characteristics of leaders and specific firm outcomes such as EI adoption (Neely et al., 2020). QCA can be especially useful for conceptualizing the mechanisms that operate across intraindividual levels (e.g., identifying the traits of leaders) and how they might combine in various configurations that can explain specific outcomes (Gond & Moser, 2021). Likewise, set-theoretical methods such as QCA are used for managerial studies because they help improve the understanding of management realities while maintaining their holistic character, i.e., innovation (Neely et al., 2020). Furthermore, fsQCA is suitable for sample sizes of 10-50.

2.3.4 Analytical strategy

2.3.4.1 Calibration and measurement validation

The first stage of the analysis involved the calibration of the data. The scores of personality traits and EI (which varied from 1 to 5) and the barriers of a 5-point Likert were translated in to fuzzy-set membership values (between 0.0 and 1.0). We set the thresholds for the 5-point Likert scale (1 to 5) as follows: 2 or below was calibrated to 0.0 (full non-membership), 3 was calibrated to 0.5 (crossover point), and 4 or above was calibrated to 1.0 (full membership) (Pappas & Woodside, 2021). After indicating these three thresholds, the SetMethods package of RStudio produced the relevant fuzzy scores. After the calibration process, to reflect the diversity and heterogeneity of cases, the conditions are first checked for asymmetry related to skewness (the conditions used in the model are less than 20% or greater than 80%) (Oana et al., 2021). See the Table Skewness in Appendix 4. Second, ambiguous cases (with a value of 0.5) are analysed. For each ambiguous case, 0.1 is added or subtracted after the calibration process (Fiss, 2011), according to the interviews with leaders.

2.3.4.2 Previous analysis

Two-step protocol: Remote and proximate conditions

Once the data are ready, the two-step protocol is applied (Schneider & Wagemann, 2013; Schneider 2019). This protocol assists in the minimization process due to the limitation of logical remainders through the reduction in the number of conditions in the necessity analysis, which is the first step, and their inclusion in the sufficiency analysis, which is the second step, through the separation of conditions (Schneider & Wagemann, 2013) into either remote (assuming the context, barriers) or proximate conditions (affecting the outcome, the personal traits of leaders) (Medina-Molina et al., 2022; Schneider, 2019). The sources of these materials are described in more detail in Table 5.

Table 5. Conditions, outcomes and sources

Conditions/Outcomes		Items	Source
Remote Barrier conditions	Technological (BTEC) Financial (BFIN) Internal organizational (BORG) Collaboration (BCOL) Lack government support (BGOV) Market and customer (BCUS) Knowledge (BKNO)		Gupta & Barua (2018)
Proximate Trait conditions	Agreeableness (AGR)	1. Sympathise with others' feelings 2. Am not interested in other people's problems 3. Feel others' emotions 4. Am not interested in other people's problems	Costa & McCrae (1992), Goldberg (1999)
	Conscientiousness (CON)	1. Get chores done right away 2. Often forget to put things back in their proper place 3. Like order 4. Leave my belongings around	
	Extraversion (EXT)	1. Am the life of the party 2. Don't talk a lot 3. Talk to a lot of different people at parties 4. Keep in the background	
	Openness (OPE)	1. Have a vivid imagination 2. Am not interested in abstract ideas 3. Have difficulty understanding abstract ideas 4. Do not have a good imagination	
	Neuroticism (NEU)	1. Have frequent mood swings 2. Am relaxed most of the time 3. Get irritated easily 4. Seldom feel blue	
Outcome	Eco-innovation	1. Design (DSEI) 2. User (USEI) 3. Product-service (PSEI) 4. Governance (GNEI)	Carrillo-Hermosilla et al. (2010)

2.3.4.3 Step 1. Identification of the necessary conditions

In step 1, the barriers are analysed using necessity analysis, as shown in Figure 7. The term necessary conditions implies that each time the outcome is present, the antecedent condition is also present. The possibility of an atomic condition, or a single barrier, being a necessary condition is analysed. When this is not the case, the possible sets of barriers for this necessary condition, which constitute a supersubset, are analysed. This constitutes the minimal set of disjunctions that must have theoretical significance and the established criteria.

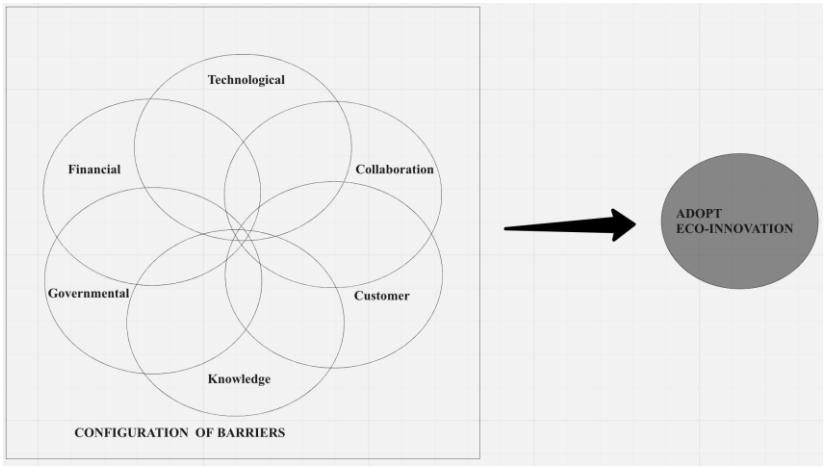

Figure 7. Step 1 of the two-step protocol

The consistency values are used to identify whether a condition is necessary for the EI outcome and its negation (~EI), which is regarded as consistency (Cons.Nec.) A threshold of 0.90 is used to identify conditions that can be considered necessary (Schneider & Wagemann, 2013). The coverage (Cov.Nec.) and the relevance of need (RoN) are accepted when the threshold is 0.50 (Bazzan et al., 2022). In the Results section, only the solutions that met the need thresholds for consistency, coverage and relevance are shown.

2.3.4.4 Step 2. Identifying the sufficient conditions

In the second step of the two-step protocol, sufficiency analysis is conducted. Before proceeding with a sufficiency analysis, fsQCA requires the creation of the truth table with consistency (inclS) > 0.75, which is the ratio of cases meeting the condition and the outcome of all cases. A proportional reduction in inconsistency (PRI) > 0.51 is the measure by which a given configuration is part of the outcome and its negation. There are two types of coverage measures: raw coverage and unique coverage. The raw coverage data represent the proportion of cases with the outcome explained by a configuration (covR) between 0.25 and 0.65. Unique coverage, on the other hand, denotes the proportion of cases where the outcome is explained exclusively by a configuration (covR). Finally, the two parameters for the complete solution (of all combinations of conditions) are consistency, the ratio of cases that are explained by the solution and the outcome. The coverage is the ratio of cases that have an outcome to those that have a solution. Again, only the solutions that met the thresholds of consistency and coverage are shown in the Results section (Eng & Woodside, 2012).

The truth table represents every possible iteration of combinations of the presence and absence of the trait conditions and the barrier conditions identified as necessary conditions in step 1 (Schneider, 2019). The enhanced standard analysis (ESA) is used for the sufficiency analysis. The ESA is carried out because standard analysis does not involve untenable assumptions, so we must keep them in mind when performing our analysis (Oana et al., 2021). We will continue with implausible counterfactuals if we have the necessary conditions for adopting EI. The conservative solution is chosen because it does not lead to more detail in these cases (Oana et al., 2021). Figure 8 provides an overview of the research process.

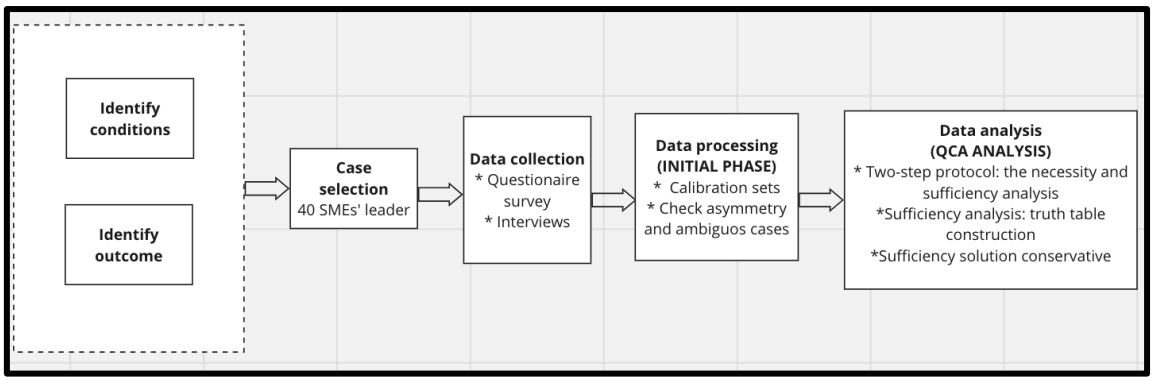

Figure 8. Diagram of the research process (research methodology)

2.4 Results

As explained above, the standard procedure was followed: first, the existence of an atomic barrier condition for each time EI adoption was studied (Oana et al., 2021). We found that no atomic barrier condition is present (see Table Necessary Conditions in Appendix 2). Thus, the existence of a subset of barrier conditions (supersubset of necessary conditions) was studied. These were combined into three supersubsets (Table 6). The first supersubset "BFIN+~BGO"): the disjunction between the financial barrier and nonperception of the lack of government support barrier, hereafter referred to as the BARN, exceeded the needed threshold. This configuration has the highest consistency, which is a crucial necessary condition in empirical analysis (Dusa, 2019). Additionally, the results met the theoretical and empirical criteria. Therefore, as we suggested in the preceding section on barriers that appear as a list for all SMEs, there is no single barrier that acts as a necessary condition; that is, there is not a straightforward barrier that consistently obstructs SMEs when adopting EI but rather a combination of them. The former suggests that proposition 1 is accomplished.

Table 6. Supersubsets

	inclN	RoN	covN
BFIN+~BGOV	0.925	0.539	0.826
~BORG+BKNO	0.902	0.522	0.809
BORG+~BKNO+BCOL+~BGOV	0.902	0.519	0.808

Abbreviations: BFIN, financial barrier; BORG, internal organizational barrier; BCOL, collaboration barrier; BGOV, lack of government support barrier; BKNO, knowledge barrier.

Second, the truth table (Table 7) was created to analyse sufficient conditions through enhanced standard analysis. This analysis included the supersubset of barrier conditions presented in the previous step (BARN condition) (Schneider, 2019) and trait conditions. There are six total conditions (see Figure 9). The table shows the enhanced conservative solution for the EI and shows the four solutions. These are four conjunctions with consistency, two covertures (covS, covU) and PRI parameters in excess of the required levels. The complete solution has a consistency of 0.873 and a coverage of 0.837, indicating that 87.3% of the cases of the solution have adopted EI and that the solution accounts for 83.7% of all cases that have adopted EI. Figure 10 shows a graphical representation of the enhanced conservative solution. The table for the conservative sufficiency solution for the negation of EI (see Appendix 3) presents covS=0.204. The conditions of a solution are considered adequate if its raw coverage (covS) is between 0.25 and 0.65 (Eng & Woodside, 2012). Therefore, discard this solution for our analysis.

Table 7. Conservative sufficiency solution with enhanced standard analysis for Eco-innovation

	inclS	PRI	covS	covU	Cases
AGR*OPE*NEU*BARN	0.967	0.949	0.330	0.053	3,15,16,19,30,35,40
AGR*OPE*EXT*BARN	0.866	0.816	0.618	0.067	1,2,5,7,11,12,20,21,27 29,31,36,38
~NEU*CON*OPE*BARN	0.880	0.830	0.613	0.041	1,2,5,7,9,10,11,14,18,20, 21,22,23,24,26,27,29,31, 33,36,38
AGR*~NEU*CON*~EXT*BARN	0.954	0.922	0.311	0.024	4,8,9,14,18,22,26,27
Solution	0.873	0.837	0.857		

Abbreviations: AGR, agreeableness; CON, conscientiousness; EXT, extraversion; OPE, openness; NEU, neuroticism; BARN, necessary barrier: a financial barrier or the negation of the lack of government support barriers.
inclS=consistency for sufficiency.
PRI=proportional reduction in inconsistency.
covS=coverage for sufficiency
covU=unique coverage

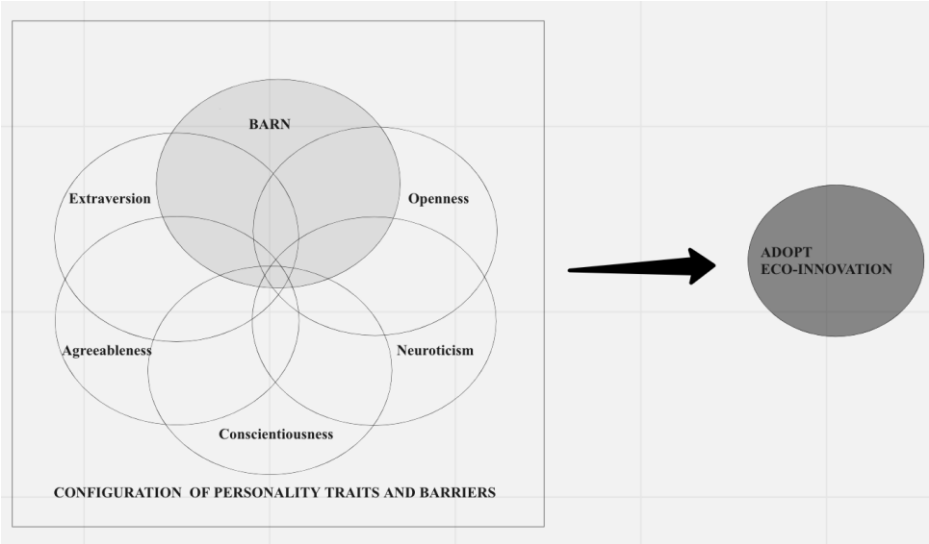

Figure 9. Step 2 of the protocol

Abbreviations: BARN, necessary barrier: financial barrier or negation of the lack of government support barrier.

All solutions include the necessary condition of the barrier (BARN). Thus, this result further strengthens the importance of financial constraints in the absence of public support schemes. This combination of barriers (BARN) and leader personality traits explains EI adoption. In other words, there are various combinations of traits that can help leaders overcome barriers and achieve a high degree of EI adoption. As shown in Table 7, the first two solutions are simplified as AGR*OPE*BARN (EXT + NEU); that is, leaders with agreeableness, openness and extraversion traits are more apt to overcome these barriers, and the quality of neuroticism is associated with agreeableness and openness. The subset including the neuroticism trait (covS = 0.330) is much smaller than that containing agreeableness, openness, and extraversion (covS = 0.618), considering the raw coverage parameter.

The third and fourth conjunctions are represented as ~NEU *CON*BARN (OPEN + AGR*~EXT). In the first case, a leader with the traits of emotional stability (not neuroticism) and conscientiousness tends to be more open to EI adoption and more able to overcome its barriers. This finding suggests that while being a responsible and stable leader assists in overcoming barriers, the trait of openness is necessary for EI adoption. In the second case, leaders who are conscientious and emotionally stable and who are also agreeable and introverted (rather than extraverted), rather than having an open mind, tend to adopt EI.

From the explanations above, proposition 2, which states that the solution to overcome EI barriers and achieve the highest level of EI depends on the combination of personality traits, is accepted, as it is supported by the conjunctural causation of QCA. Thus, analysing the traits of leaders in relation to EI adoption alone is not recommended.

Regarding proposition 3, the equifinality of QCA supports the idea that there are four combinations of personality traits that enhance the adoption of EI, including one that involves the disjunctive effect between the financial barrier and one that involves the

negation of the lack of government support barrier (BARN). Each SME leader can interpret the barriers in various ways. For example, in our study, the SME leader in case 4, who exhibits a combination of traits of the third conjunction, does not consider financial slack a barrier. However, the SME leader in case 9, who exhibits a combination of traits of the first conjunction, does perceive financial slack as a barrier. Therefore, EI adoption depends on leader trait combinations and leader interpretation of the EI barriers. In other words, if leaders consider such factors to be obstacles to EI adoption, then they perceive them as barriers; otherwise, they do not. Consequently, proposition 3 is supported, indicating that various combinations of personality traits and barriers facilitate the adoption of EI.

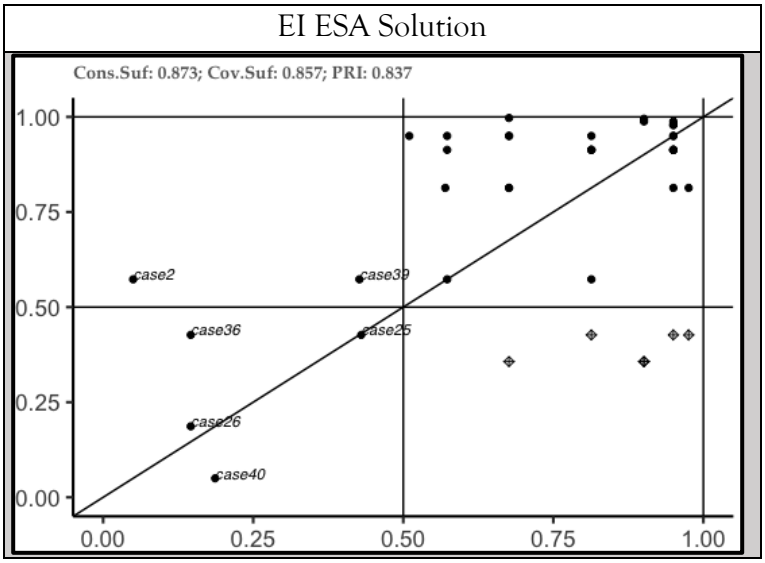

Figure 10. Conservative sufficiency solution for EI adoption based on ESA

Robustness test

In accordance with the recommendation of Oana et al. (2021), a robustness check was conducted to enhance the credibility of the conclusions. This examination involved three steps: (1) establishing the sensitivity of the parameters, (2) establishing fitting-oriented robustness and (3) establishing case robustness. The first step, the calibration range test, shows that modifying the calibrations has no impact on the result. Moreover, the number of required cases, when higher than 1 and the consistency level was modified beyond 0.85, impacts the results (see Table 8). Appendix 5 shows the plot represents the initial solution (Enhanced conservative solution) and the min/max Test Set.

Second, Table 8 presents the fit-oriented robustness results and is used to compare the fit parameters for the initial solution (IS), the robust core (RC) and the minimum and maximum test sets. All the parameter scores were above 0.8. Regarding case-oriented robustness, both the number of robust deviant consistency cases and the number of typical robust cases are high, indicating that many of both the robust deviant consistency cases and the typical cases are robust compared to the total number of such cases (robust, shaky and possible). A ranking of 2 indicates the existence of possible cases.

Table 8. Robustness test

Calibration Range				
		Lower bound	Threshold	Upper bound
AGR	Exclusion	NA	2	2
	Crossover	3	3	3
	Inclusion	3	4	6
NEU	Exclusion	2	2	2
	Crossover	3	3	3
	Inclusion	4	4	4
CON	Exclusion	NA	2	2
	Crossover	3	3	3
	Inclusion	4	4	4
EXT	Exclusion	NA	2	2
	Crossover	3	3	3
	Inclusion	4	4	4
OPE	Exclusion	NA	2	2
	Crossover	3	3	3
	Inclusion	4	4	4
BARN	Exclusion	NA	2	2
	Crossover	3	3	3
	Inclusion	4	4	NA
Raw Consistency Test		0.85	0.85	0.85
N. Cut Range		1	1	1
Robustness parameter EI				
Fit-oriented		RF_cov: 0.935 RF_cons: 0.983 RF_SC_minTS: 0.919 RF_SC_maxTS: 0.962		
Case-oriented RF		RCR_typ: 1 RCR_dev: 0.857 RCC_Rank: 2		
Performing models				
AGR*OPE*BARN + ~NEU*CON*OPE*BARN + AGR*~NEU*CON*~EXT*BARN (2) RCC_rank: 2 SC:0.844 AGR*OPE*BARN + ~NEU*CON*OPE*BARN + AGR*~NEU*CON*~EXT*BARN (3) RCC_rank: 2 SC:0.844 AGR*NEU*OPE*BARN + AGR*EXT*OPE*BARN + ~NEU*CON*OPE*BARN + AGR*~NEU*~CON*~EXT*BARN (1) RCC_rank: 1 SC:1.0				

Abbreviations: AGR, agreeableness; CON, conscientiousness; EXT, extraversion; OPE, openness; NEU, neuroticism; BARN, financial barrier, or negation of the lack of government support barrier; EI, eco-innovation

2.5 Discussion and conclusions

The results obtained from surveying 40 leaders of Spanish SMEs involved in EI lead us to the following conclusions. First, we found that different combinations of barriers arise in adopting EI, corresponding to the various interpretations of leaders depending on whether they perceive barriers to EI. Second, we find that personality traits influence the sensemaking process of SME leaders by helping them interpret the combination of barrier

conditions and institute EI adoption as a strategy. Finally, we revealed that specific combinations of leader personality traits determine EI actions.

On the one hand, three distinct barrier combinations are identified: (1) the interaction between the financial barrier and the lack of government support barriers, (2) the interaction between the knowledge barrier and the lack of internal organization barriers, and (3) the interaction among internal organization and knowledge barriers (internal), collaboration and the nonperception of limited government support barriers (external). Regarding the first combination, previous studies have also highlighted financial restraints as an EI barrier (Arranz et al., 2019; Ghisetti et al., 2017; Jabbour et al., 2018), but we find that this condition is unlikely when EI is being funded by government programs. This finding confirms that public support can offset financial EI barriers, particularly for SMEs. This complementarity also strengthens the idea that the effectiveness of public funding interacts with the availability of external financing, as argued by Cecere et al. (2020). Regarding the second combination, we find that knowledge barriers can hinder EI adoption even under a lack of internal organizational barriers. This finding suggests that when internal organizational barriers are low, SMEs can more effectively leverage external knowledge to drive EI. The lack of internal organizational barriers assists in overcoming technological lock-ins and engaging in EI collaboration with suitable partners (Marin et al., 2015). Finally, the relationships between internal organizational and knowledge barriers (internal barriers) and between collaboration barriers and the nonperception of limited government support barriers (external barriers) suggest that both types of barriers are essential for explaining EI adoption. This result is in line with the findings of previous studies that show that internal and external factors either hinder or facilitate EI (Arranz et al., 2019; Kiefer et al., 2019). Thus, given these three combinations of barriers, we suggest that there is no single objective barrier to EI adoption for all SMEs. This conclusion is in line with the findings of Bakos et al. (2020, p. 8), who stated that "all SMEs are unique, and so are their barriers".

We show that the perception of EI adoption barriers is based on leader personalities. Relying on the sensemaking process, and more specifically on its interpretation phase, reveals that certain personality traits play essential roles in leader decisions. In this vein, by establishing the first set of barriers, which is the most theoretically significant and the best fit for the set criteria, four combinations of personality traits are identified as enhancing EI. First, leaders who naturally combine warmth, kindness, and an outgoing, sociable personality (agreeableness, openness, and extraversion) see a lack of government support as the most challenging barrier. With an extensive network of connections, they recognise the need for public funding and feel justified in seeking it. They trust in their ability to overcome this obstacle, readily navigating complexity. They explore creativity through new avenues of thinking to generate new ideas (openness) (Şahin et al., 2019). Furthermore, they exhibit confidence in their interactions (agreeableness). Moreover, the openness trait is one of the most critical traits associated with environmental concern and may offer a broader perspective of humanity's place in ecology (Hirsh, 2010). In line with the studies by Milfont and Sibley (2012), openness and agreeableness are the personality traits most strongly linked to environmental engagement. This finding aligns with that of Ceglia et al. (2017), who concluded that these traits are crucial for carrying out all activities within an ecological industrial park, even in the face of a significant regulatory barrier. Therefore, our findings show that to overcome the lack of governmental support

for EI, leaders must exhibit clear traits of openness and agreeableness. These leaders could be identified with the labels charming and collaboratively environmental. Second, we identify a highly committed, demanding personality with a strong sense of responsibility and a reluctance to delegate (conscientiousness, introversion -no extraversion-, agreeableness and emotional stability -nonneurotic-) for those leaders who do not consider a lack of government support as a barrier but rather see financing as such. According to Hirsh et al. (2010), leaders with conscientious traits exhibit high levels of self-discipline, self-improvement, and competence, displaying the behaviour needed to adhere to environmentally positive norms. Based on our results, we find that these leaders perceive external barriers, such as limited government support, as beyond their reach; however, they view these barriers as obstacles to financing, which they perceive as being within their control and competence. These findings support those of Zacher et al. (2023), who explored a green behavioural framework for those working on leadership teams and emphasised conscientiousness as the most suitable trait for addressing those barriers that primarily exist within the work context, including those involving internal resources, such as financial barriers. We can assert that these results indicate that leaders with the conscientious trait can overcome financial and internal barriers. Nevertheless, these leaders do not view the government's lack of support as an obstacle. These leaders align with the label of demanding and self-reliant.

In the third and fourth combinations, we find that neuroticism is a significant trait in EI adoption. The presence and negation of neuroticism appear in the solutions, confirming that this study's methodology can effectively identify conditions with opposite causal effects depending on the combinations presented (Schneider & Wagemann, 2013). On the one hand, the presence of neuroticism is linked to openness and agreeableness. This result is in line with that of Hrazdil et al. (2021), who highlighted the positive influence of neuroticism and agreeableness on the social and environmental engagement of leaders with the aim of enhancing sustainability. This finding echoes the literature on hubris and ruthless leaders with a tendency toward EI adoption (Arena et al., 2017; Petrenko et al., 2016; Tang et al., 2018; Zhang et al., 2020). Previous studies have highlighted the relevance of neuroticism to environmental issues (Wiseman & Bogner, 2003). However, recent research has suggested that this trait might be the least suitable for achieving sustainability (Ceglia et al., 2016; Milfont & Sibley, 2012). Leaders with neurotic tendencies can overcome these barriers by balancing this trait with openness and kindness. These leaders could be known as neurotic yet compassionate. On the other hand, the fourth combination, nonneurotic, is linked to conscientiousness and openness. A highly stable personality trait (no neuroticism) and careful work (conscientiousness) characterised by a strong sense of carefulness make such individuals likely to meticulously adhere to social guidelines and norms regarding environmentally responsible actions (Hirsh, 2010). Overcoming barriers is crucial to EI, which can be stressful if rigorous compliance processes prolong this process. Leaders with a high degree of openness can help make this process shorter and thus more resilient for the firm, as they can apply new ways of acting based on creativity and curiosity to explore new opportunities. Therefore, this trade-off between perfectionism and a broad mindset leads us to label them as resilient and composed leaders.

2.5.1. Theoretical and methodological contributions

In light of the relatively scarce attention given to the personality traits of leaders in the EI literature, the relationships among the aspects of SME leadership personalities, barriers encountered, and EI adoption are analysed, which broadens and deepens the literature. This study makes two significant theoretical contributions and a methodological contribution to the literature.

First, this study's results contribute to a new conceptualization of EI barriers by considering leader interpretations, thus highlighting the importance of the complex relationship between EI barriers and leader motivations through a sensemaking lens. From a theoretical perspective, the use of such a sensemaking view advances the study of personality traits and EI barriers. Although this approach has been widely used in organizational studies as a means of understanding how individuals interpret and respond to their environments (Sandberg & Tsoukas, 2015), we believe that sensemaking can help elucidate how individual personality traits influence the perception and interpretation of EI barriers. In this regard, SME leaders with specific personality traits, such as agreeableness, openness and conscientiousness, perceive and interpret barriers differently than leaders who exhibit other traits. Leaders may be more willing to engage in EI despite the perceived barriers, or they might interpret certain barriers as challenges to overcome rather than as overwhelming obstacles. Relatedly, the present work contributes to sensemaking theory by revealing the importance of interpreting information to assess potential barriers to EI (Weick, 1995). Thus, this approach enables the integration of the influence of individuals' and firms' heterogeneity on the ability to overcome barriers and the willingness to adopt EI. This goal is in line with the numerous studies that have attempted to reveal such heterogeneity by distinguishing various firm profiles and sectoral patterns (Kiefer et al., 2019; Marin et al., 2015). In addition, our theoretical view considers the sensemaking process to influence strategic SME decisions and actions in EI adoption, thus properly linking sensemaking theory to strategic cognition theory.

Second, considering a combination of personality traits rather than relying on a single trait is pivotal in attaining the highest EI level, thus contributing a renewed approach to the reconfiguration of these traits. Under this assumption, it is confirmed that the reconfiguration of leader personality traits facilitates the adoption of EI. From a theoretical view, the impact of each leader's personality traits may depend on their combination with other traits following microfoundational research. In line with previous recommendations made by other authors (Bossle et al., 2016; El-Kassar & Singh, 2019), we discourage the analysis of leader traits in isolation regarding EI adoption but rather encourage a consideration of their various configurations.

Finally, as a methodological contribution, we show that the QCA method is a more suitable empirical methodology than other common methods used in the existing empirical evidence. To date, traditional statistical methods, which are often based on linear patterns, symmetrical relationships, and the uniform causal effects of each variable, have been widely used. These methods suggest that more or less frequent traits can lead to varying degrees of EI adoption, thus revealing the effects of these factors. Following the debate on whether microfoundational factors can be elucidated through the use of traditional statistical methods (Ou et al., 2015; Petrenko et al., 2016), the QCA methodology contributes to a

better understanding of the influence of personality traits on EI outcomes; in other words, this methodology contributes to better understanding the causes of these effects. This finding aligns with that of Jaleha and Machuki (2018), who argue that linear models are inadequate for investigating how a distinct and isolated trait influences the scope of EI.

2.5.2 Implications for managerial practice and policy

Our results have important implications for managers, entrepreneurs and policymakers. First, enhancing the understanding of SME managers regarding the influential personality traits associated with EI barriers can help them become more aware of which barriers they can easily overcome, and which ones might require assistance. We argue that the more leaders invest in self-awareness, for instance, through a coaching process or self-awareness program, the better they can adjust their actions when overcoming barriers. In other words, all knowledge regarding oneself can be translated into improvements within the company when facing EI obstacles. In the end, understanding one's self helps in making more informed and strategic decisions, thus potentially nurturing a business environment that is more innovative and environmentally conscious.

Second, maintaining an emphasis on the importance of combinations of leader traits for overcoming EI barriers is particularly relevant for educators in the field of entrepreneurship, particularly for those focused on EI businesses. This enables educators to highlight which members within entrepreneurship teams are more likely to complement each other and which leader traits have the potential to result in greater success, which depends on the particular barriers and sector involved. Specifically, regarding the formation of teams and the selection of staff, educators should consider the combination of traits that these future employees possess. For instance, if a leader has a highly conscientious trait, even to the extent of being obsessed with environmental issues, then they should surround themselves with individuals who exhibit agreeableness or openness. This approach can help offset this overwhelming focus and facilitate a more open and opportunistic perspective.

Finally, from a policy perspective, exploring the adoption of EI offers fresh insights into ways to boost sustainability in SMEs. Considering personality traits when addressing the barriers to EI adoption and sustainability in general, which is a dynamic that has been largely overlooked until now, is crucial. We urge academics to pay closer attention to the psychology of actors in the sustainability literature. This perspective can generate new ideas aimed at innovative societal transformations.

Chapter 3. Emotion barrier busters: how circular economy SME leaders face emotions and rock on

" The leaders' expressed emotions would then spread to their followers through emotional contagion"
(Ashkanasy & Humphrey, 2011, p. 219)

3.1 Introduction

The emotionality that moves at the Climate Summits can be seen in speeches, such as Greta Thunber's oft-heard speech at COP24, "How dare you?" or in the negotiations, often accompanied by frustration, disappointment, or relief (Huy, 2005). Companies are present at these summits and know that if their performances are emotionally resonant, they will have a more significant impact. An excellent example of this was when Brad Smith, CEO of Microsoft, announced his commitment to action on climate change by appealing to moral responsibility through a personal concern for the planet's future at COP25 in Madrid. In other words, leaders facing this transition have many challenges to meet because of the numerous adversities of the current environmental and social crisis (Walls et al., 2021). Emotions play a critical role in leader' decisions in the face of these barriers (Friedrich et al., 2015; Sharma, 2000). Thus, emotions are at the heart of the leader's day-to-day life. If leaders do not know how to manage these problems well, they can become emotionally draining, which can eventually cause them to abandon this vital task (Boyatzis et al., 2006).

Emotions are "complex and intense reactions elicited by events or situations that individuals find personally significant and typically involve a subjective experience, a physiological response, and behavioural tendency" (Valor et al., 2022: 2). The topic of emotions is an under-explored area in the entire domain of management (Walls et al., 2021). However, emotions are essential in management because the feelings of the individual play a fundamental role in the micro-processes of the company. This is particularly important when it comes to committing to sustainability (Aragón-Correa et al., 2004).

Despite the recognition of the importance of emotions in leaders' decision-making (Zhu & Thagard, 2002), the existing literature about barriers to the transition to circular economy (CE) at the micro level focuses mostly on two aspects: it either examines managers' commitment, awareness and knowledge of sustainability issues (Ahmadov et al., 2023) or the employees' responses to sustainability-oriented leadership (Ahmadov et al., 2023; Cheffi et al., 2023; Eide et al., 2020; Soni et al., 2023). Given the importance of emotions in organizational behaviour research (Hartel et al., 2005; Voronov & Vince, 2012), exploring a leader's emotional response to a barrier is a gap in the literature. To analyse the leaders´ emotional experiences when facing these barriers is essential because it helps us to a better understanding of leaders' behaviour modification. Furthermore, it can have a powerful impact for leaders in this transition to sustainability, enhancing their awareness of and ability to overcome these barriers, as emotions and cognitions intertwined in the adaptation to the implicit changes.

Recognizing the subjective nature of a leader's perceived barriers to moving their enterprise toward the CE (Bakos et al., 2020; Fernández-Muñiz et al., 2024; Marin et al., 2015), it is vital to consider the intersection of emotional and cognitive processes that affect how leaders assess, cope with, and hopefully overcome barriers. Thus, we pose a question

regarding the emotional pathway of the leader when they deal with barriers. First, this research maps what emotion arises when the leader faces the barrier in the CE SMEs. Although a barrier uses to be related with negative emotions that lead to negative responses, this is not necessarily the case. Based on psychological studies (Lowe & Ziemke, 2011), it is required to look at the specific relationship between the barriers that a company leader perceives towards sustainability and their emotions. For instance, if a leader encounters a big customer who ultimately does not hire them, this is the barrier, and the leader goes into panic because of the economic consequences it may have for the company. These leaders could have a negative response, in which their emotional interpretation help them to react to the barriers, activating combative behaviour and attacking the customer in some way. Or the leader could not experience fear but rather calm while observing and dealing with the barrier. So, it is essential to study this behaviour to give an answer to the following question: What emotions do leaders experience when they encounter a barrier that moving forward to a more sustainable and CE?

Second, cognitive appraisal theories of emotions (Frijda et al., 1989; Roseman, 1984; Scherer, 1988) typically expect that a specific emotion encountered in a complicated (stressful) situation will generate an appraisal that mobilises the person to respond to this emotional experience through coping (Lazarus & Folkman, 1984; Smith & Kirby, 2011). Two important elements in emotional experiences arise: firstly, cognitive appraisal, that is, the evaluation or interpretation of the relevant event (Lazarus, 1991; Roseman, 1991) and, secondly, coping strategies refers to the cognitive and behavioural efforts made by the people to manage internal or external demands that are perceived as challenging or beyond their resources (Lazarus & Folkman, 1984). Lazarus (1991) posits two phases of appraisal that influence behaviour. In an initial appraisal, one assesses whether a situation is relevant or threatening; after in a second appraisal, one analyses how to handle the challenge according to available resources. A cognitive appraisal relates to the inclination to act according to emotional experiences (Arnold, 1960; Scherer et al., 2001). To try to analyse the process of emotional experience dealing with the barriers to CE, we look at both former stages. Both types of appraisals influence our behaviour and coping strategies. The first shows us whether the situation represents a threat or a challenge and, the second one, helps to consider the available resource. It is essential to show how a leader's cognitive appraisal of a barrier triggers emotions. We must also trace the pathways of these emotions in their experience. So, we posit the question as follow: How do leaders' cognitive appraisals and subsequent emotions influence their choice of coping strategies when dealing with the barriers to a more sustainable and CE?

This chapter aims to answer these two unsolved questions in the previous literature. We argue the suitability of using a qualitative phenomenological analysis to proxy the CE SME leaders' emotions. To do that, we conducted personal interviews and ask leaders to put in somewhat extreme situations with barriers experienced before to know what they described their emotions. This study intends to identify and analyse how these leaders express the emotions they experience when dealing with a barrier. In addition, we provide a complete discussion and reflection. Moreover, two coping strategies are identified to buster barriers to CE.

This chapter is structured as follows: section 3.2 provides the conceptual background on the barriers of SME leaders to the transition to CE and the used framework based on

emotional experiences from SME leaders to face CE barriers. Section 3.3 explains the methodology employed for the qualitative research based on Interpretative Phenomenological Analysis. The presentation of the main results follows this. Section 3.5 discusses the findings and conclusions. Finally, like Chapter 2, the limitations and future research avenues of this study will be discussed in Chapter 4 devoted to the discussion of the thesis.

3.2 Conceptual background

3.2.1 The barriers of circular economy SMEs' leaders

Barriers are the reasons why something is not implemented (Johnson & Schaltegger, 2016). Companies making the transition to sustainability, unlike traditional ones, face many added barriers due to the big challenges of sustainable practices as new and innovative (Ahmadov et al., 2023). Some examples of this are the successive regulatory changes by the administrations, adapting to the financing requirements for these new business models, or mature markets, which in many cases needs not only a positive attitude and perception about circular products or services towards more environmentally purchases and switch to a more CE (Camacho-Otero et al., 2018). Effectively, regarding stakeholders, the diverse perceptions of and awareness about sustainable development and CE make it difficult for SMEs to identify the most suitable interpretations that align with the principles of CE (Ho et al. 2023; van Langen et al., 2021).

The barriers towards CE experienced by SMEs have been examined from different angles and sectors. From a multi-level perspective, macro-, meso- and micro-level factors influence on the transition to a CE by SMEs (Kirchherr et al., 2017). At the micro level, some of the examples would be from the consumer's view (Ozaki, 2011), from the more technical side, resources such as materials (Sulong et al., 2015), from innovation (Álvarez Jaramillo et al., 2019) and from business model aspects (Torres-Ruiz et al., 2018). There are different ways of categorizing these barriers, notably, into internal (inside the company) and external (non-dependent on the company) (Min et al., 2021; Redmon, 2008); barriers within in-going, implementing at least one of the CE measures, or non-going firms (Garcés-Ayerbe et al., 2019). Another current stream highlights that there are not a unique size for barriers because they depend on many factors, among them the sector, the location and how they are perceived (Bakos et al., 2019; Fernández-Muñiz et al., 2024; Marin et al., 2015). Recognizing these varied barriers leads to understanding the link between barriers and enabling criteria to overcome them.

Several authors have established a direct link between barriers to adopting CE and enabling criteria to amend these deficiencies (Bakos et al., 2019; Del Rio, 2005; Kiefer et al., 2019). The literature provides an interplay of macro-, meso- and micro-level factors to analyse their barriers. The macro level encompasses the challenges, and as such, a paradigm shift entails political and cultural changes, among others. It is crucial to stress the role of different actors, from consumers to companies, in transitioning to a CE from a bottom-up approach guided by the civil society (companies and citizens/consumers) instead of a top-down perspective (van Langen et al., 2021). Everyone's contribution is significant in addressing the scarcity of natural resources and other important issues (Vermunt et al.,

2019). Another barrier is the ineffective recycling policies of governments (Ranta et al., 2018; Rizos et al., 2016). At the meso-level, different difficulties are represented in processing and implementing eco-industrial parks, i.e., the organisation of the reverse infrastructures (Ormazabal et al., 2018). The literature addresses various actors at the micro level, from consumers, companies, employees and products. Among these barriers, the most explored are consumers' lack of interest in circular business models, resistance from stakeholders with vested interests in the linear economy, the ability to deliver high-quality products, design challenges to create durable products, and lack of technical knowledge and expertise to move from a throwaway culture to a culture of durability (to narrowing, closing and slowing the loops) (Cooper, 2020). When exploring these barriers, "the moods and emotions of managers likely determine to a significant degree what the firm attends to and how it responds, to say nothing of the emotional significance of the stimuli for the individuals concerned "(Hodgkinson & Healey, 2011, p. 1504). Thus, foreknowledge of uncertain implementation changes the psychological context of decision making, for example, by increasing ambiguity, and offering new opportunities for linking strategic management with behavioural neuroscience (Powell et al., 2011). This means that SMES' adaptive capacity (i.e., their ability to develop high levels of resilience and agility), which enables them to bounce back in difficult times, identify and seize opportunities as they emerge, and create disruption in business models, as happens in the CE paradigm, depends not only on stimuli (barriers) but also on their emotional response.

Some authors recognise that technological innovations (Suchek et al., 2021) alone are insufficient to address barriers and that one must look towards essential issues such as employee motivation and manager leadership (El-Kassar & Singh, 2019; Guoyou et al., 2013; Li et al., 2019). The consideration of this more micro analysis within the firm seems fundamental, and studies are currently expanding in the field of microfoundations. In this regard, individual-level actions and interactions underpinning organizational capabilities can foster the transition to a CE or overcome environmental entrepreneurship resistance in relation to SME taken into account the diversity of leaders ´ intentions, and motivations, and the influence of internal and external factors (Fernández-Muñiz et al., 2024; Pierscieniak et al., 2023). In other words, individual-level analysis of psychological cognition is used to explain firm-level outcomes through interactions in the context (Walls et al., 2021). This perspective is related to "the importance of ethical leadership, awareness, and management commitment to overcoming barriers in driving the adoption and implementation of CE practices in SMEs" (Ahmadov et al., 2023, p. 17), if we gain a deeper knowledge of these leaders and their behaviour, it will be easier to understand, identify and address these barriers and help them to overcome them. What remains to be discovered are the emotions that appear when they encounter barriers in their business activity and how leaders cope with these emotions; or in other words, how the affective processes experienced by leaders influence the adoption of CE.

3.2.2 Emotions and the role of coping strategies to deal with the barriers

In order to analyse the role of emotions in facing the barriers, it is a prerequisite to define different types of emotions. In general, affects are a combination of moods and emotions. Moods are low-intensity affective states that do not last in time without a previous apparent cause, for example, feeling bad. Emotions are more intense, last less than moods and have a definite target (Forgas & Laham, 2005). According to Lazarus (1991,

p:6), "emotions are complex, patterned, organismic reactions to how we think we are doing in our lifelong efforts to survive and flourish and to achieve what we wish to ourselves". In this effort to survive and flourish the leaders' encounter barriers. Emotions are constituted by four elements (Lazarus, 1991; Pham, 2007): the cognitive appraisal associated with an emotion, the valence of an emotion, the arousal of an emotion, and the action tendencies.

Although Arnold (1960) was the first author to give importance to cognitive appraisal in the elicitation of emotion, it will not be until 30 years later that the fundamental concept of cognitive appraisal is defined (Lazarus, 1991). It refers to the assumption that it is not the objective characteristics of an event that produce emotion, but the appraisal that people make of that event that causes it to produce emotion. Based on this perspective, there are two types of cognitive appraisal (Lazarus, 1991): automatic and non-conscious, which may include complex meanings synthesised by experience; and conscious and deliberate. However, Roseman (1984, 2011) proposes that emotions arise from individuals' appraisals of events in five evaluation dimensions: motive consistency, responsibility, controllability, probability of occurrence and certainty. The same event can be appraised differently by individuals who would then experience different emotions. In this way, appraisal-based theories of emotions explore three key areas: (1) identifying the inherent traits of events that are appraised; (2) determining the emotions that arise from this appraisal process; (3) understanding the behavioural responses triggered by these emotions (Lazarus, 1991; Scherer, 2001; Smith & Ellsworth, 1985).

All emotions have a valence (Ortony et al., 1988). Emotions are either positive or negative but never neutral. Some emotions tend to be associated with a single valence: as an illustration, sadness and rage share a negative valence, whilst happiness and love share a positive valence. Other emotions are associated with different valences; surprise and compassion may be associated with a positive, negative or mixed valence, depending on the situation.

Emotional arousal, the degree of reactivity to a stimulus (Mohammad, 2015), plays a significant role in decision-making. Emotion theories suggest that three levels of emotional arousal can be distinguished, each influencing the way we process information: high, moderate and low. In conflicts with high emotional arousal, detailed reasoning about the situation can occur; in conflicts with moderate arousal, cognitive reflection on our knowledge takes place; and, finally, in conflicts with low emotional arousal, knowledge processing may be more superficial (Buijs & Lawrence, 2013). Emotional arousal stimulates individuals to base their decisions on rational beliefs about an issue (Fischer and Glenk, 2011). For instance, in the context of a sustainable SME, leaders may base their decisions more on their beliefs when faced with high emotional arousal, given their strong belief in environmental and social aspects (Boiral et al., 2019; Yamoah et al., 2022). Finally, action tendency explores the consequences of an emotional experience: "Action tendencies are states of readiness to perform a certain type of action, involving both bodily arousal and psychological readiness following emotional appraisal" (Zhu & Thagard, 2002, p. 28). Action tendencies are considered as the internal desire states believed to underlie emotions and overt behaviour (Arnold, 1960; Frijda, 2007), such as approach and withdrawal behaviours (Frijda, 2007). For example, it can be observed two different action tendencies with the emotion shame. On the one hand, self-attack is directed inward as self-

deprecation, and on the other hand, withdrawal or avoidance of social contact is a behavioural tendency of embarrassment.

The appraisal process triggers emotions. These appraisals and their related emotions affect coping processes, altering the dynamic between the person and their environment. The altered person-environment association is reappraised, and the reappraisal leads to a change in emotion (Smith & Ellsworth, 1985). From this view, the role of coping is essential to the emotional response. In the CE context, the coping strategy taken by the leader will influence how the barriers are acted upon. The literature defining coping has differentiated between two essential functions related to two different strategies of coping: Problem-focused coping refers to "the management or alteration of the person-environment relationship that is the source of stress". This may include planning, seeking help, or modifying the situation causing the stress. While emotion-focused coping, which underscores the value of interpersonal relationships, refers to "the regulation of emotions" that starts in response to the problem (Folkman & Lazarus, 1980, p. 223), including relaxation techniques, cognitive restructuring or seeking emotional support.

Furthermore, different emotions enable different patterns of coping strategies. For example, anger, finding the concrete solutions to remove the trigger that elicited the anger. For fear, is trying to reinterpret this threat as something more manageable. The connection between the felt emotion and its coping strategies can find a natural place in various theories of the secondary emotion appraisal (Arnold, 1960; Frijda, 1986; Lazarus, 1991). Secondary appraisal is a mental evaluation of harm or benefit to the individual. From the appraisal theory, coping strategies are natural consequences of a given emotional appraisal of how to manage with the situation that has arisen from the emotion (see Figure 11)

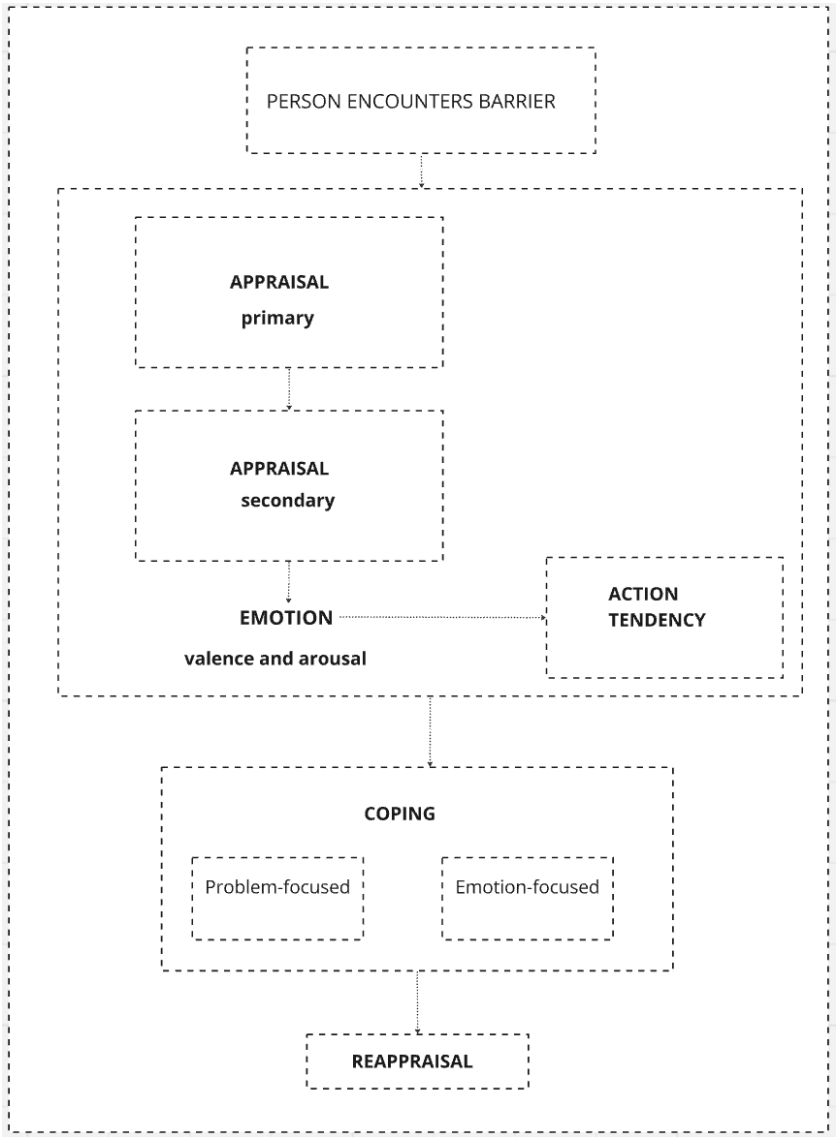

Figure 11. Based on Lazarus & Folkman (1984), Smith & Lazarus (1990) from Appraisal Theory

Despite the significance of cognitive appraisals and the coping strategies with emotions (Lazarus, 1991; Lowe & Ziemke, 2011), their relationship with CE barriers and leaders is scarce in the literature. Some research has noted the association between career barriers and emotions (London, 1997; Tsaur et al., 2016), where a thorough exploration is made of how individuals appraise and cope with barriers depending on their resilience. In the corporate and management literature, existing studies on emotions and barriers do not delve into the emotional process per se but rather discuss emotions and actions in general. In this regard, they examine the concept of emotional emancipation, which involves removing affect-based constraints that result in negative emotions, thus allowing for alternative positive emotions (Ruebotton & Toubiana, 2021). Emotional emancipation is a way of neutralizing a negative emotional response. In this way, generating pride and diverting shame facilitated emotional emancipation, avoiding the harmful effects for entrepreneurs. Shame could be diverted cognitively by reframing the identity of workers who were stigmatised for something that gave them value. This concept of emancipation is also discussed in other studies (Creed et al., 2014; Tangney et al., 2007). Additionally, it

has been also explored how social barriers—acts of discrimination, practices of corruption, or interpersonal conflicts—and shame affect entrepreneurial development (Hoogendoorn et al., 2019). The emotional and cognitive energy is channelled towards resolving the shame felt from submitting to perceived unfair domination by others rather than being directed towards business growth goals, which involves managing reluctant acquiescence (Doern & Goss, 2011). Finally, some studies investigate linguistic barriers in multinationals, and once again, how positive appraisals of negative emotion can mitigate the effect of a negative response is explored (Tenzer & Pudelko, 2015). Unfortunately, none of these studies explore the interplay between emotional and cognitive processes in leaders' emotions and coping actions, nor considers the emotions of SME leaders who are engaged in the CE.

3.3 Methodology

3.3.1 Methodological approach

We adopt a qualitative research approach for this study. Specifically, the chosen methodology is the hermeneutic phenomenology. A phenomenological approach is appropriate as it primarily "seeks to generate a greater understanding of lived human experience" (Butler et al., 2017: 7). This method is essential for exploring lived experiences and reflective practices in the fields of education, psychology, counselling, health sciences and management. Moreover, it is an experience-based method when studying the lifeworld. A distinctive aspect of phenomenology is its commitment to uncovering and communicating aspects of lived meaning without succumbing to the impulse to theorise, categorise, or abstract (Adam et al., 2017). The phenomenological method is especially suitable because it allows an in-depth approach to the emotional experiences of the participants, being able to share their processes with emotions while minimising the extent to which the researcher's viewpoints and experiences might frame the analysis (Butler et al., 2017).

3.3.2 Recruitments, interview guide and procedure for analysis

The research consisted of 17 leaders were recruited see Table 9 (more details in the introduction of the thesis above). They received a consent form ensuring confidentiality and the anonymity of the authors. The conversation was conducted flexibly and dynamically, with the authors listening to open-ended questions tailored to the leaders' experiences according to the phenomenological approach (Neubauer et al., 2019). Creating a trusting and relaxed climate was essential since we focus on emotions, and we need to be sure they feel very comfortable (Creswell & Poth, 2016). First, they told us how they were related to their company and the current situation. Then, we focused on a review of all possible barriers to adopting a CE in their company, namely technological and ecological resource-related, financial and economic, poor external collaboration and stakeholder engagement (Fernández-Muñiz et al., 2024; Gupta & Barua, 2018). Out of all the barriers we presented to them, they had to had to identify which one they felt most hindered their progress towards CE adoption. Once the barrier was identified, we suggested that they think about and remember a specific moment they had experienced when they encountered this barrier. At that point, we probed about the emotional experiences when facing this barrier. We tried to separate what the experience was from an opinion, vision, or interpretation of what they experienced. We tried to make the interviews more like

dialogues in which the interviewer guides the discussion (Adams & van Manen, 2017; Crewell & Poth, 2018).

All interviews were conducted online, except for two that were conducted face-to-face. Interviews were recorded and transcribed and lasted between forty minutes and one hour. Interview transcripts and observation notes were read and reread. The analysis considers the phenomenological method (Van Vuuren, 2012), which understands participants' emotional experiences in the phenomenon of their barriers. The authors searched for themes in each interview, taking notes and identifying connections among them. First, the initial interviews were coded for themes related to the coping strategies taken by leaders after facing barriers. Subsequently, these interviews were coded for the emotions reported and the declared appraisals of these emotions. A table was then created to organise and compare the codes for coping strategies. This comparative process allowed an emerging model that connect appraisals, emotions, actions and coping strategies. The same table was used for the remaining interviews to infer appraisals, emotions, coping strategies and their relationships. Themes that reflect shared aspects of the experience for all leaders were identified. The codes were then grouped into categories, nVivo software was used to assist with the analysis. Finally, internal notes were kept and triangulated with another researcher (Van Vuuren, 2012).

To achieve greater detail to identify and label the coping strategies, the researchers had to pay close attention to the transcription and triangulate with another researcher. For the coding of emotions, we used what participants reported, but on some occasions, they could not identify the emotion and expressed it through facial expressions and gestures. Emotions are expressed in many ways, using metaphors, non-verbal communication. We use everything, that's why the interviews are videotaped. For this, we referred to previous literature (Edwards, 1999, as cited in Valor et al., 2024). Sometimes, the leaders were straightforward about the valence and arousal of the emotion, expressing it indirectly.

Table 9. Description of the participants

Interview number	Name of participant	Studies	Sex	Sector	Zone
1	Miriam	University	F	Food	Rural
2	Lucas	University	M	Energy	Rural
3	Carla	University	F	Retail	City
4	Nahúm	University	M	Architecture	City
5	Josemi	University	M	Retail	City
6	Anthony	University	M	Logistic	City
7	Jaime	University	M	Industry	Rural
8	Kirsty	University	F	Industry	City
9	Candela	University	F	Industry	City
10	Jota	University	M	Industry	Rural
11	Irina	University	F	Industry	Rural
12	Rubi	University	F	Food	Rural
13	Gerardo	University	M	Food	Rural

14	Alejandro	University	M	Food	Rural
15	Ismael	University	M	Retail	City
16	Xoel	University	M	Industry	City
17	Sergio	University	M	Industry	Rural

Elaborated by authors.

3.4 Findings

First, we mapped a set of emotions that the leader experiences when faced with the barriers. We grouped them according to the pattern of the leader's cognitive appraisals and coping strategies following the barrier. Second, we show coping strategies emerging from the leaders' experience, their emotions when dealing with barriers they perceive as most limiting, and their subsequent appraisal of these. Notably, we uncover two particular coping strategies ("inspiration" and "deliberation").

3.4.1 Emotions at the barriers of CE SMEs leaders

These emotions reveal the different experiences that leaders go through. We group them according to the valuations and response of the leader, which are then carried out concerning the barrier. For example, if the leaders have the firm intention of overcoming the barrier or if they directly consider it lost and do not overcome it. The first group of emotions experienced towards barriers are anger and frustration. Anger is a response to an obstruction to achieving a goal, often directed towards a person or situation perceived to be responsible for that obstruction and associated with high arousal and a tendency to take action (Ekman, 1992). Frustration occurs when the expectation of a reward is interrupted or blocked, leading to a negative emotional response and increasing the likelihood of an aggressive response (Amsel, 1992; Berkowitz 1989). We observed that the emotions had a negative valence and have high intensity but limited duration. As Rubi, who has been running an CE SME for many years, comments, she feels that faced with the funding barrier, everyone is now being treated the same. Her company has long been committed to these business models: "Handling the difficulty of financing, it bothers me that we are treated the same as those who have just started approaching CE; I feel that a great injustice is being created, which makes me furious". Similarly, Alejandro again referred to the economic barrier, expressing his anger at not understanding why he was not granted funding when everything was correct: "If everything is so good, if the numbers are correct, why don't they grant it to us? It is incomprehensible". However, some respondents recognise that, although experiencing this emotion, it was a fleeting experience. For example, Mirian comments: "This anger is a sudden emotion. The next day, I already have another feeling", Irina: "I prefer to be angry because I release it faster and it goes away sooner..., in a certain way, I let off steam". In this sense, the emotion of frustration also emerges. We observe it when Ismael wants to make a significant leap in turnover with his already mature SME and encounters the difficulties of financial support to carry it out: "momentarily it is frustration, I think that first there is like an instinctive impulse, that comes to you, which is frustration".

The second group of emotions is comprised of fear and powerlessness. Both are negatively valence (averseness) and high arousal emotions although the experience reported by participants is not very intense. Xoel comments on how the experience of a situation

that he does not expect from a client generates uncertainty: “Suddenly, you don't know where to go from here. A barrier appears that you didn't expect and that a priori could mean that this project would have to stop. Initially, you feel very uneasy about the future but, on the other hand, you stop, think about it again and continue with the project”.

Finally, the third group is comprised of sorrow and vicarious embarrassment. These emotions, with a negative valence, play a crucial role in interpersonal relationships. While we may perceive that their arousal is higher than in the first group, their duration in time is also longer. In this case, the emotion is linked with something fuzzy or impersonal, for example, society or the context; those who feel the emotion are mere transmitters. In the first group, the emotion of anger could go against those who experience the emotion or other; always, the target is concrete. However, in this group, the emotion goes towards something beyond oneself. The sorrow is not towards oneself or others but towards the world, a more tremendous grief. In this case, vicarious embarrassment is more significant than simple shame; it affects a community.

Gerardo tells us that when faced with the barrier of the regulations that must be complied with: "I feel resentment toward others. It is a sorrow for society; this way, it does not make sense. We are doing it wrong as a society. Society should be able to decide, for goodness’ sake. Why do these things happen through public bodies, where so much money moves? It makes you feel ashamed of who you are". (See Table 10 for a summary of the emotions).

Table 10. Characteristics of CE SMEs leaders’ emotions

Emotions	Anger, frustration	Fear, powerlessness	Sorrow, vicarious embarrassment
Barriers triggering this emotion	Funding	Client	Regulation
Valence	Negative	Negative	Negative
Arousal	High	High	Low
Temporality	Fleeting	Sustained	Sustained
Target of the emotion	Concrete	Concrete	Fuzzy

Elaborated by authors.

3.4.2 Coping strategies by CE SMEs leaders

Inspiration

This overcoming movement action, coupled with the emotion of anger or frustration, reveals how an emotion characterised as negative can turn around and emphasise the leader's personal strength to be inspired to overcome the most limiting barrier. Thus, this first coping strategy is called “inspiration”.

> *I am not going to throw a tantrum like a child. My anger and desire to generate changes arise in relation to how the world works and how it has to be transformed. This gives me an impulse to sell more sustainably. It makes me want to have more capacity to be more self-sustainable and to make our company worth much more (Miriam).*

Within the companies these executives are leading, there is a solid corporate purpose to generate positive impacts on society and the environment. As illustrated in the dialogue of Miriam's experience, these leaders feel very identified with this mission. Above what happens to them with this barrier is the positive impact they want to generate with their business despite the difficulties: this appraisal identifies that the SME's purpose is more important than the individual. Even if the impact is small, they feel the responsibility not to give up and to generate a movement, as shared by Lucas: "Because anger also entails a reaction, and that reaction is more in line with what I am trying to do in this case, which is to extend this sustainable knowledge a little more, even knowing that we are tiny compared to large corporations. Therefore, everything we do may be a drop in the ocean, but it is a drop".

Another essential appraisal is that creativity is the way as we can see in the following text in which we collect anecdotes where we hear how it is triggered after the perceived emotion:

> *What happens is that the emotion goes through the body, and the next thing is I get my batteries, and I say to myself, I can do this; it is like a thing of empowerment; I am going to go for this using all my creativity. Using creativity is lasting, maintained over time" (Miriam).*

It seems that creativity could balance this momentary negative feeling and put itself at the service of the creative. Carla exemplifies it like this: "This path is cut off, so we will have to look for another one by which we can continue. I spend my energy looking for this action in front of the barrier".

Finally, it is easy to react to a difficulty, experience a negative emotion, and start blaming; this would be the most common way of not acting on the situation (Lupton & Warren, 2018). We have observed precisely the opposite: after a setback, the leader activates themself to overcome that hardship, focuses on resolving it and does not react by seeking blame, he aligns himself with the positive action of moving forward. Thus, this appraisal does not find blame (see Table 11). Sergio's story is illustrative, he says:

> *I am not angry with myself for not succeeding; I remain more hopeful that the thing did not work out well, but next time, it will. I do not stay in this state of passive sadness without acting. Even knowing I am up against everything; I do not look for someone else's guilt. The barriers do not turn me off, but on the contrary, I believe that although it will not be this time, next time it will.*

Deliberation.

In this case, the action tendency of the emotion lies to the approach. The coping strategy is such that the leaders will stop and see what is most convenient. We incorporate decision-making, allowing them to manage their emotions better. The emotions before this action are fear and powerlessness. The emotion of fear refers to short-term emotional episodes directed at problematic uncertainties or uncertain threats (Kurth, 2015). Meanwhile, powerlessness could be defined as the lack of power, the lack of competence or ability to do something. In this action that carries out these emotions, we will distinguish two cognitive appraisals that will identify this response with its emotions.

First, listening to Candela telling us about her experience after facing uncertainty, we realise that, in this case, she is aware of what this barrier means: "Not all doors have been opened, far from it, and there are some that close, at this moment you feel uncertainty, you do not know what is going to happen. However, what is certain is that we believe in what we do; we are in it. Moreover, once the mourning is done, I tell myself I will play to see what happens". Candela recognises that her strength and the contrast with the uncertainty come from the security that her company gives her, a particular pride in doing things well, and this does not allow her to withdraw but to decide to continue and take a gamble. Along the same lines as the above, Jota tells us how he feels uncertainty in the face of his most significant barrier and has to decide on where to continue:

> *I feel uncertain because I suddenly do not know how to go on. On the other hand, at least for me, uncertainty is followed by a new impulse, not by going backwards. The first is uncertainty, that is, doubt. You see what happens. You stop, reflect, and decide, feeling new impulses to continue with that project.*

The second cognitive appraisal is the emotion of impotence facing the barrier. Irina tells us an anecdote about this emotion and how she lives the subsequent experience: "Two years ago, we made a brutal effort to design more respectful packaging, with more innovative materials, and we had to stop. I called all the factories we work with, and none were willing to do it for such a small order. Of course, I also understood them; it was also a risk to assume for the manufacturers. Moreover, the impotence emerges; we are so small that we do not have the autonomy to do what we want. I think something like, please, someone help us. We next thought we had to look for someone who would gamble on us because we are worth it". This anecdote shows how she feels her responsibility and does not throw it away. She also relies on the company's values, as in Candela's case, to find a calm and considered solution. (See Table 11 for a summary of the findings).

Inaction.

In this case, there is no coping strategy. The action tendency of the emotion is withdrawal. The emotions that arise before the barrier are sorrow and vicarious embarrassment. Sorrow is an emotion that arises when there is a feeling of loss. In this case, what is lost is what leaders want to get before they meet the barrier. The participants reported the clear difference between sadness and sorrow. They defined sadness as something concrete, an individual feeling; however, sorrow is identified as something more general, significant, and encompassing more than one cause. In the case of vicarious embarrassment, the feeling experienced is embarrassment, discomfort, or rejection in the first person before the action of the third person, which seems embarrassing, ridiculous, or pathetic.

In the dialogue with the participants, what they experienced when they felt sorrow was like a feeling of total disengagement with other people; the attitude of others was too far away to try to do anything. Nahúm told us this about a client, in this case, the barrier he faced was the market that was not mature:

> *I made an economic effort so that my client could make his house as sustainable as possible, and we adjusted the price a lot, this project had a more positive impact on the environment. In the*

end, he did not accept the deal, and I was deeply disappointed; he left me stranded, and I had trusted him. I thought, we have come so far; now, let him go his way, and I will go mine. I think the experience is the closest thing to passiveness on my part.

Experiencing a powerful sense of helplessness in the face of such a barrier is something that also arises in some leaders as if something more significant than them is happening and they cannot cope on their own, Josemi says: "it is a feeling of pity for society; I feel sorry for society. We can do something, and even if we are small, we do it, but everything would change if we all did it. So, on a social level or as a citizen, I have a feeling of sorrow, even mild despair, that nothing is being done". The appraisal here is that one cannot control all of this by oneself.

This negative experience following the emotion of sorrow leaves the leader in a place of little action since placing the responsibility on the rest leaves little margin for action. The general feeling of these leaders with this emotion is how will I be able to handle all this if I am too small? They generalise a concrete fact, or a concrete loss, to society as a whole. In some cases, this general sorrow even influences how others see them or how they see themselves; they become absorbed by victimhood, and the appraisal is non-recognition:

> *Just looking at myself gives me sorrow, especially sorrow that I live in a country where I am not considered, where I am considered as nobody. I have travelled to other countries and seen that farmers with a broad vision for the environment are considered to have a certain prestige; here, it does not exist. You do not exist (Jaime).*

The other emotion that will be outlined in this section is vicarious embarrassment. In this case, the feeling materialises when the barrier is linked to a specific person, not so much to something more abstract, such as an institution or humanity, which would be the previous case of the emotion of sorrow. The discomfort experienced is because of something a person says or does. Anthony exemplified how he felt an obvious embarrassment when a client turned him down on a potential deal: "After spending five years convincing him that we are as efficient in quality and price as any other transportation company that does not work with disabled people, in the end, he turned down the contract. I felt very embarrassed, if only for shame (he felt no shame nor has he ever felt it) he should have said yes". Here, we see a sense of superiority on Anthony's part as this leader feels he has much higher values than the client. Somehow, Anthony does not empathise with the client, and this causes him to take no action to be able to reverse the client's decision. It also happens to Kirsty when an environmental technician comes to see if they comply:

> *I feel embarrassed on behalf of the public administration technicians that they do not get on with things such as recovery and recycling, despite knowing all that they have to do now regarding objectives. That you have to be the one to inform them that a royal decree has been issued and that what they are telling you is not so, is very unprofessional. The only result is that you stop doing things.*

Again, the leaders overvalue themselves; the barrier in this case was the public administration and the changing and continuous regulation. Kirsty feels that public sector professionals must resolve her barrier and focuses all her energy on complaining to them.

Out of all the actions she has the opportunity to take, she chooses to remain in the complaint and do nothing. See Table 11 for a summary of the findings.

Table 11. Relationship among cognitive appraisals, emotions, actions tendency and coping strategies

Cognitive appraisals	Emotions	Action Tendencies	Coping Strategies
• The importance of the SME's purpose • Creativity is the best approach • Avoid external blame	Anger Frustration	Approach	"Inspiration"
• Risk-taking is worthwhile • Taking responsibility is worthwhile	Fear Powerlessness	Approach	"Deliberation"
• The inability to control everything • Lack of recognition • Nothing is completely grasped	Sorrow Vicarious embarrassment	Withdrawal	

Elaborated by authors

3.5 Discussion and conclusion

In this chapter we aimed to enrich our understanding of how emotions operate in the leaders´ behaviour of SMEs in the context of CE. In other words, the emotional pathway they follow when they face barriers. This research mapped the emotions that emerge in this encounter, the diverse appraisals, the action tendencies and the coping strategies that are carried out. Moreover, we identify three possible coping strategies, grouping from different emotions: "inspiration", "deliberation" or no coping strategy.

This study has various main implications for both theory and practice. First, this study offers a valuable and comprehensive view of the role of emotions in sustainable business research, particularly useful for researchers focused on understanding whether leaders experience such emotions might help them to overcome the barriers to adopt CE business models. This study shows that the effects of emotional impact on these barriers have an immediate impact, limiting the individual's control, requiring complex negotiations, and with lasting consequences (London, 1997). We also show that the same barrier can trigger different emotions in each leader. Moreover, our findings reveal a variety of emotions experienced by CE leaders, such as anger, frustration, fear, powerlessness, sorrow or embarrassment, providing deeper insights into whether these emotions facilitate or not overcoming barriers to these transition to a more sustainable economic system.

Anger and frustration prompt the leader to overcome the barrier. In some cases, we perceived how the leader even rejected an emotion with negative valence and identified emotions with positive valence. However, they ultimately identified the emotion of anger or frustration. The latter is in line with some studies emphasizing how emotional anger generates a positive response even when having a negative valence (Smiley et al., 2016); in our case, the positive response is the intention to overcome the barrier. We highlight that anger elicits when the leader cannot control an adverse event (Lazarus, 1991). Our study suggests that the arousal of anger in response to a sudden barrier is relatively high and fleeting in time. It arises to function primarily as a catalyst for action.

Furthermore, it emphasises how the leader experiences emotions of fear and powerlessness, perceiving a lack of control. Fear is typically associated with high levels of uncertainty (Watson & Spence, 2007). However, in our study, fear is reported as a significant emotion, suggesting that is not intensely perceived. The emotion of powerlessness is consistent with the findings of Doern & Goss (2011), where leaders confronting barriers feel compelled to relinquish their values, subsequently reporting feelings of humiliation.

Additionally, in our article, this sorrow refers to the emotion experienced by the leaders about their environment, not towards them. It would be an emotional implication of the leader's internalization of social norms and personal judgments, showing how these factors trigger emotions of vicarious embarrassment or sorrow towards the person who constitutes the barrier. In these cases, even though the barrier person experiences a negative emotion, the leader does not engage in an act of empathy. Moreover, leaders report experiencing embarrassment when facing barriers. Public normative deficiencies are the most common causes of embarrassment (Miller, 1992). Mainly, this emotion is activated by themself in some situations in which the person is clumsy, clueless or hapless (Tangney et al., 2007). In our study, this emotion does not come from the self but through another. Frequently, this type of embarrassment is called cringe, and it is common in the literature that it is linked to humour, which is called cringe humour (Mayer et al., 2021). The difference between cringe and our case of vicarious embarrassment is that in the former, the individual empathises with the speaker's negative emotions. In our case, however, the leader's embarrassment is not triggered by the person who constitutes the barrier's negative emotions. Instead, it is activated by social norms, particularly those related to sustainability, and the leader's own judgments. Something similar happens with the emotion of sorrow. Sorrow is a form of self-compassion that displaces the significant other from the centre of concern and allows for greater intimacy with oneself (Atkins, 2022).

Secondly, the findings reveal patterns on how leaders emotionally and psychologically respond to barriers in adopting CE. The study highlights varied emotional reactions and coping strategies triggered by similar obstacles. Each emotional process is paired with a coping strategy. After emotional appraisals, diverse action tendencies arise and configure different coping strategies. The primary emotions leaders experience when facing barriers are anger and frustration, which correspond to the first coping strategy we call "inspiration". Traditional coping strategies, often based on Folkman et al. (1986), include confrontation, distancing, self-control, seeking social support, accepting responsibility, escape avoidance, problem-solving, and positive reappraisal. In this case, "inspiration" fits into planful problem-solving, focusing on resolving the issue and positive

reappraisal, which emphasises personal growth. The emotions leaders feel, influenced by cognitive appraisals, drive their coping strategies (Smith & Kirby, 2011). Each emotion consists of multiple layers of information and appraisal, forming the basis of the leader's experience (So et al., 2015). For instance, when a leader is confronted with a challenging CE situation that triggers anger, various appraisals can help to manage them: using the corporate's purpose as a guide (Ruiz-Pérez et al., 2023), the belief that creativity can overcome it being a powerful motivator for action (d'Orville, 2019), or the understanding that as a CE SME, you are responsible for solving your own problems, as no one else will do it for you. According to Smith & Ellsworth's (1985) model, anger is linked to unpleasantness, certainty that the barrier can be overcome, high controllability, and attentional focus. Overcoming the barrier is determined by the emotion's valence and the leader's evaluation of whether the goal is achievable. This link between appraisals and emotions aligns with studies showing that anger is not always tied to a pessimistic outlook (Lerner & Keltner, 2000).

A second group related to the coping strategy is termed “deliberation”. This strategy involves a clear sequence of actions: pausing, reflecting, and deciding on a course of action. It serves as an intermediate response in line with Folkman et al. (1986) who previously discussed coping strategies between accepting responsibility, acknowledging one's role in the problem, and self-control, describing efforts to regulate one's actions. Notably, the arousal associated with this emotion is not very intense, which allows for more deliberate actions from a cognitive perspective. In this case the appraisals that emerge is the recognition that taking risks and responsibility in the context of CE is worthwhile, implying that the leader acknowledges and addresses the situation. The latter makes sense if we are talking about a profile of a conscientious leader with a highly committed and demanding personality and a strong sense of responsibility (Fernández-Muñiz et al., 2024). This coping strategy, summarised as decision-making, aligns with the findings of Son et al. (2015), who explore decision-making contexts in greater depth and analyse how emotional appraisals may influence these processes.

Finally, we did not identify a coping strategy in the last group, which included the emotions sorrow and vicarious embarrassment. The inaction following the emotion leads us to a conclusion close to the most widespread literature where one of the action tendency options is withdrawal (Frijda, 2007; Maxwell & Davidson, 2007). In this case, we focus on primary appraisals. According to Lazarus & Folkmann (1984), they can be classified into three types: irrelevant to one's well-being; benign/positive if the situation is appraised as preserving the person's well-being; or stressful if the person's needs are implicated in the situation in a way that exceeds the person's resources. Three appraisals are associated with this last category of primary appraisal: the inability to control everything, the lack of recognition, and nothing is completely grasped. This leader with these appraisals could fit with a leader with hubris traits (Fernández-Muñiz et al., 2024), where he needs his environment or stakeholders to address barriers. Therefore, we have observed that leaders with these emotions, appraisals and action tendencies in these circumstances are closely linked to self-centred people. Although the empirical results in the existing literature regarding action tendencies after embarrassment is not conclusive because in some cases, it is withdrawal, and in others, it is an approach tendency, we are aligned with the literature that associates this emotion with a withdrawal action (Tangney et al., 1996; Wicker et al.,

1983). In addition, we provide the appraisals linked to this withdrawal tendency, which ultimately leaves the leader in a state of inaction, i.e., no coping strategy.

These findings align with the literature on moral battery, emotional energy and social entrepreneurs. The terms highlight the role that emotions play in social movements, where this process of emotional transformation leads to the impulse to overcome difficulties. This potential for positive action from negative emotions is motivating and encouraging, making it clear that the role of emotions in individuals can determine the outcome of overcoming a prolonged obstacle. From the experience of a negative emotion is transformed into action energy (Barberá-Tomás et al., 2019; Jasper, 2011). Both cases grouped by "inspiration" and "deliberation" start from negative emotions, yet the barrier is overcome.

Chapter 4. Discussion. Theoretical and practical contributions, limitations, and opportunities for future research

This last chapter contains the discussion regarding the theoretical and practical contributions of the thesis to the literature, possible managerial and policy makers implications and further lines of research.

The conclusions and inferences are drawn from the three chapters advocate for studying leaders' attitudes and behaviour towards sustainability. It has been shown their role as key agents to protect natural environment and face against climate change, considering their interpretative processes influenced by their personality traits and emotions. In this section, we highlight the implications for managers, entrepreneurs, and policymakers, displaying the importance of the research findings. We also want to show their value to a deep understanding of the leaders' behaviour in the context of sustainability and CE.

4.1 Theoretical contributions

The thesis makes a sixfold contribution to the current scholarship on leaders adopting circular economy (CE) and eco-innovation (EI). Furthermore, we drive a theoretical integrative view based on main findings of this doctoral thesis as the last contribution.

First, it has been shown the complexity of firms and leaders adopting innovations related to the CE and EI. These phenomena cannot rely exclusively on upper-echelon theory and how leaders' characteristics impact on strategic decisions processes and organisational performance. Instead, it advocates for the combination of different management and psychological perspectives, or the use of theories that delve into leaders' role on the transformative processes implicit in the adoption of EI or the transition towards a more CE. This approach has the potential to significantly enhance our understanding of successful processes for adopting CE and EI led by involved and consciousness individuals who manage SMEs, offering a hopeful outlook for future research and practice.

Second, based on the literature review, we contribute by presenting two distinct archetypes of leaders championing the CE and EI. These archetypes are starkly different; the first, with its negative traits (narcissism, arrogance, hubris), focuses more on the company's financial performance than on societal and environmental impact. In contrast, the second archetype, often referred to as the "bright-side", embodying self-awareness and acceptance of one's limitations, leading to self-transcendence and a focus on the world. This archetype holds the potential for positive change, as it is possible to integrate different personality traits to help these leaders overcome the many diverse challenges they face. This classification is an understatement, as the non-sustainability-focused business literature is not only broader, but also more diverse, offering a wealth of knowledge and perspectives to explore (Akhtar et al., 2018; Alvarenga et al., 2019; Gómez-Leal et al., 2022).

Thirdly, achieving optimal levels of EI requires a paradigm shift to consider a combination of personality traits rather than a single trait. We argue that these reconfigurations are critical in successfully adopting EI. Theoretically, the influence of a leader's personality traits can be significantly enhanced when combined with other traits, as microfoundational perspective suggests. In line with previous recommendations (Bossle et al., 2016; El-Kassar & Singh, 2019), we discourage the isolated analysis of leader traits

for EI adoption. Instead, we advocate the examination of different configurations of personality traits (i.e., the combination of these conscientiousness and openness personality traits brings a meticulous view to regulatory requirements framework and enhance network collaboration to acquire valuable information to innovate).

Fourth, we adopt a sensemaking perspective to analyse the relationship between personality traits and barriers to EI. This theory, utilised in previous organizational studies, helps us to understand how individuals (leaders) interpret and react to their environments (Sandberg & Tsoukas, 2015). However, it has yet to be claimed to be understood how personal traits affect the perception of EI barriers is essential. Specifically, leaders of SMEs with certain personality traits perceive and interpret these barriers differently than leaders with other traits. Such leaders may be more inclined to pursue EI despite perceived barriers or view certain obstacles as challenges rather than insurmountable difficulties. Furthermore, this study significantly contributes to empirical evidence based on sensemaking theory. From our humble point of view, we expand and enrich our knowledge about SME leaders' characteristics by highlighting the role of interpreting information in evaluating potential barriers to EI (Weick, 1995). This understanding can enlighten our approach, allowing for integrating individual and organizational differences in overcoming obstacles and fostering the willingness to adopt EI by SMEs. These last third and fourth findings tackle the third research question of this thesis.

Fifth, the chapter devoted to the analysis of leaders' emotions concludes by conceptualizing three different pathways of a leader's emotional experience when facing barriers to adopting CE. This research is valuable as it provides a comprehensive understanding of the emotional journey of leaders in the face of barriers. Each pathway is mapped with emotions, different appraisals, action tendencies, and coping strategies. The first pathway, which corresponds to coping strategy we call "inspiration". Despite occasionally rejecting negative emotions due to the difficulty of processing them, leaders, in this case, often report themselves with feelings of anger or frustration. This issue aligns with previous research suggesting that such emotions as the intention to overcome obstacles can elicit positive responses (Stephens & Carmeli, 2016). Each emotion encompasses multiple levels of information and emotional appraisal; some of these appraisals that have emerged from our study include the importance of the SME's purpose, the creativity or avoiding external blame. The second pathway is identified by a coping strategy that we call "deliberation". The emotions that emerge are fear and powerlessness, associated with a lack of control. It should be noted that the arousal of these emotions is reported as not very intense, allowing for more deliberate actions from a cognitive perspective. In this case, the emerging appraisals recognise that taking risks or taking responsibility is worthwhile, emphasising the value of the leader's decisions. This coping mechanism, characterised by decision-making, corresponds with the conclusions of Son et al. (2015), who delve further into decision-making contexts and examine how emotional evaluations can shape these processes. The last pathway, a profoundly human aspect of our research, refers to the inaction. This inaction aligns with existing literature, where one action tendency option is withdrawal (Frijda, 2007; Maxwell & Davidson, 2007). Sorrow and vicarious embarrassment, the emotions leaders report as the most prominent in this pathway, underscore the human element in our study. These emotions would fall under the category of emotions related to social perception or self-evaluation (Lewis, 1995). There is a noticeable lack of empathy towards the individual constituting the barrier, often called

negative empathy, coupled with an excessive preoccupation with the leader's internalised social norms and personal judgments. Three appraisals associated with this action are the inability to control everything, lack of recognition for efforts, and nothing is completely grasped.

Sixth, our study shows the potential repercussions as a methodological advancement; we show that the QCA method offers a superior empirical approach compared to other conventional techniques. We use the two-step protocol to identify remote (barriers) and proximate conditions (personality traits). It solves efficiently the combination of personality traits with contextual conditions. Thus, our results are in line with the ongoing discourse on lack of efficacy of traditional statistical methods for elucidating microfoundational factors (Ou et al., 2015; Petrenko et al., 2016). Moreover, we argued that QCA method is better than linear models to examine the influence of the combination of different personality traits. Therefore, QCA methodology provides a more nuanced understanding of the impact of personality traits in combination with context conditions on firm performance.

4.1.1 Integrative View of the Findings

Finally, the thesis contributes to an original view of the CE and EI in SMEs, by considering personality traits and emotions in overcoming barriers. To systematise the main findings, we propose an integrative framework based on inductive process (see Figure 12). It summarises the main findings and advancements in the understanding of the relationship between the leader's personality traits and emotions. This model not only illustrates the relationship between the barriers faced by leaders who wish to adopt the CE and EI and the negative emotions that emerge, but also provides a practical classification of emotions according to their origin and context. Although this categorization, established by previous studies (EKman, 1992; Lewis, 1995), was not the focus of our thesis, the relationship between these emotions, cognitive appraisals and coping strategies, which can be applied in real-world scenarios, is one of the main contributions of this thesis. On the other hand, it highlights how, through the personality traits of the leaders, barriers are perceived as more or less challenging to overcome. Based on this assumption, we classify the leaders into four categories related to their combination of personality traits: charming and collaboratively environmental, demanding and self-reliant, neurotic yet compassionate, and resilient and composed.

This model contributes to the literature establishing a crucial link between the literature on personality traits and emotions of SME. In addition, the barriers they face in adopting EI and to achieve the transition to CE from a novel perspective. Our study contributes to the emerging literature on the microfoundations of sustainable leaders by analysing the interplay between leaders' personality traits and their emotional pathways when confronted with barriers. Since previous management studies neglect the challenges of overcoming barriers depending on leaders' perception, especially in the context of emotions, we consider that we make an original research proposal. We address this gap by suggesting the link between personality traits and the emotional journey, examining the appraisals and coping strategies of these leaders' emotions as they "embrace" sustainability. Specifically, we link our first category of leaders—charming and collaboratively environmental (characterized by agreeableness, openness, and extraversion)—to a coping

strategy we term "inspiration". This finding aligns with the literature on positive engagement coping, which suggests that individuals with high levels of openness and extraversion are better equipped to manage traumatic events or social stress (Carver & Connor-Smith, 2010; Moskowitz et al., 2009). However, this result does not align with other findings in the literature (Carver & Connor-Smith, 2010; John & Srivastava, 1999), where the corresponding personality traits for this coping strategy would be neuroticism and extraversion. Effectively, the combination of these latter traits corresponds to leaders whose emotional response involves taking no action to address barriers contrary to our assumptions based on previous evidence.

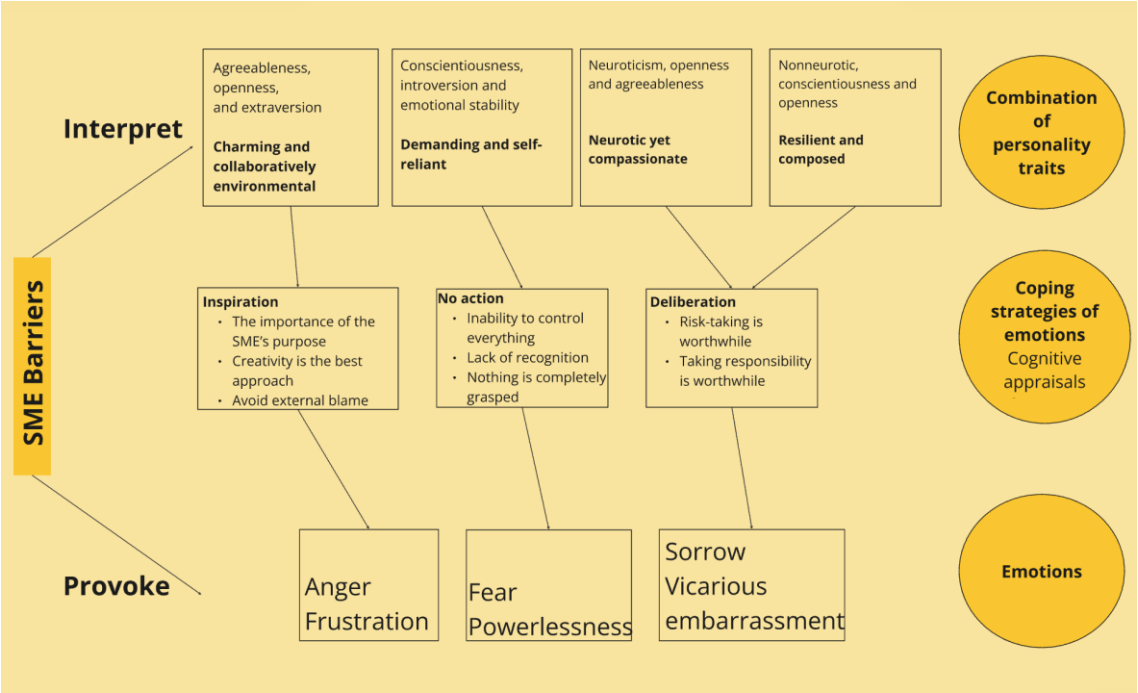

Figure 12. Integrative framework of findings. Elaborated by authors

The remaining two categories of personality trait combinations, neurotic yet compassionate and resilient and composed, play a significant role in a more deliberate emotional response, which we term "deliberation." This concept describes how leaders with these personality traits take time to make the most appropriate decisions, often navigating emotions of uncertainty and powerlessness. Leaders who are neurotic yet compassionate (characterized by neuroticism, openness, and agreeableness) experience neuroticism as a destabilizing factor. They often require time to achieve stability in their responses, a process that can be complex and indefinite (Carver & Connor-Smith, 2010; John & Srivastava, 1999). However, when combined with openness and agreeableness, these leaders feel a strong sense of responsibility, driving them to attempt to overcome barriers. Their cognitive judgments often involve taking responsibility and recognizing the value of risk-taking as a worthwhile endeavour. Finally, resilient and composed leaders (non-neurotic, conscientiousness, and openness) are the embodiment of stability, experiencing few emotional highs and lows. Their steadfastness provides a sense of security, as they are deeply committed to their moral values and overcoming barriers. However, their conscientiousness trait ensures that they do so in a measured and responsible style.

4.2 Practical implications

This section reflects the main implications of the thesis's findings on SMEs practitioners, policymakers and public opinion in the context of sustainability, CE and EI.

Firstly, in today's sustainability-focused world, it is crucial that managers and professionals provide specific information on their organisation's environmental benefits to ensure that their practices contribute to sustainability. It will enable to what they are doing and to help us to better understanding on their role in sustainable development. This also involves the crucial aspect of cultivating a deeper self-awareness and understanding of their role in promoting sustainable practices. This personal growth journey is essential, as managers who are willing to know themselves in depth will be much more capable of exercising and fostering conscious leadership. This kind of leadership, discussed in academic and non-academic literature (AACSB, 2023; Mackey & Sisodia, 2014), involves managers being aware of their decisions and their impact on society and the natural environment. These managers emphasise mindfulness, ethical considerations, and a holistic approach to management. The holistic approach integrates various dimensions, prioritizing stakeholders such as the environment and society over just shareholders. Additionally, the development of a high consciousness (conscious leadership) by them will provides them with the necessary tools to effectively implement CE practices despite the challenges they have to face.

Moreover, a critical practical implication for businesses and their executives in the context of the sustainability, CE and EI is the need to build effective teams to address the challenges of this transition. Considering the mix of personality traits among team members can help the company achieve optimal CE and EI levels. As we see in Chapter 2, for instance, combining conscientiousness and openness is beneficial for handling day-to-day regulatory details -conscientiousness- while staying connected with the network of stakeholders -openness- to understand the impact on the team behaviour and listen their response as constructive feedback (to achieve organizations more horizontal).

Second, it is needed to mention the policy and regulatory implications of this research. Since the European Green Deal and the Circular Economy Action Plan signed in 2020 aim to achieve a cleaner and more competitive Europe, policymakers could take into account the new insights about the CE leaders of SMEs and their specific response to diverse barriers. Our results can help to design tools to improve the institutional changes required to changes on material use, recycling, product life extension or extended producer responsibility, among others, will affect SMEs in the coming years, that is, at short run. Politicians and policy should include accompanying and supporting measures to help these leaders who implement CE business models. In that case, their early involvement can help tailor measures to respond to their concerns and needs, fostering a collaborative rather than confrontational relationship between regulators and firms. This potential collaboration should encourage and motivate both type of economic agents. In addition, their leadership can inspire employees and other stakeholders to commit to sustainable practices in the production and consumption stages, ensuring the success of Green Deal initiatives.

In addition, the results also can help to achieve a best allocation of public funds in entrepreneurship programs focused on CE and EI. Through these funds, some non-profit firms, such as foundations, could train our future entrepreneurs and leaders for this transition to sustainability. In the same sense, although entrepreneurship educators believe that the success of training future leaders requires more competencies on “hard” business functions, the importance of “soft skills” learned through experience has been recognised. However, there is still a long way to develop more skills in the field of psychology in the improvement of these programmes. Therefore, analysing the personality traits of future leaders or the relational model configuration of these characteristics could be improved their relationship with themselves and others. Furthermore, it is essential to determine the extent to which "soft skills" should be integrated into traditional business disciplines, rather than being maintained and taught as a separate subject. A direct application of this thesis would be to integrate self-awareness into the design of business models that are more tailored to this personality trait (a joined start-up alone or with other people) or even to the type of financing of the company (crowdfunding or competitive funding round). . There are already pioneering programmes in other disciplines, such as the stock market-related research, where personality traits and emotions are considered when investing, underscoring the importance of this approach in business: “risk management and psychological control when investing” (Pablo Gil, 2023).

Lastly, public opinion perception and engagement are crucial to the success of initiatives and interventions. Therefore, it is vital that the most reliable information from professionals deeply committed to the CE and EI guide public opinion and journalists as the fourth estate in the democratic societies. As we have seen in the process, this thesis has attracted the attention of those interested in learning more about these future leaders. Moreover, this approach not only brings sustainability issues closer to the public but also makes them feel involved and responsible, fostering a specific business culture renowned for its impact on sustainability.

4.3 Limitations and opportunities for future research

This thesis presents several limitations that should be noted, some of which have already been discussed earlier. However, these limitations also open exciting opportunities for future research. For instance, in Chapter 1, the selection of keywords may have omitted some essential articles relevant to the leader's description as seen in the literature or included any perspectives different from those in the systematic review. Similarly, excluding articles from non-impact journals, conference proceedings, or publications in languages other than English limits the inclusion of all relevant articles to ensure quality (Mohamed Shaffril et al., 2021). This paves the way for future studies to explore these areas and contribute to the field of microfoundations of leaders’ studies.

In Chapter 2, given that this work is based on interviews and surveys, the number of SMEs accessed is limited and constrained to Spain. In future research, we would like to contrast our propositions and results using a larger sample of SMEs located in other European countries and/or SMEs located in other continents in which leaders have distinct cultural values and face different norms and regulatory barriers to CE transition. Second, the Big Five personality traits are used as causal conditions that combine with the barriers to EI adoption. Due to this study's focus on personality traits and the limited

number of conditions assessed through QCA, alternative conditions have not been explored. It would be very interesting to include human values, such as Schwartz's ten values (1994) or Hofstede's scale (González-Moreno et al., 2024) in future studies or to assess emotional aspects beyond those linked to leader personalities in SMEs. We would also like to analyse emotions in strategy work to obtain further insights into our understanding of strategy as practice (Brundin & Melin, 2006). Finally, we can attempt to establish a cause–effect relationship between these specific combinations of leader personality traits and barriers and the economic, social and environmental impacts of EI on SMEs (triple-bottom perspective). In other words, it would be very interesting to determine the consequences of decisions based on the sensemaking process and whether the interpretation of EI barriers to and EI decision-making after this experience. Importantly, EI barriers are not static but rather change over time and across contexts. Therefore, SME strategies for overcoming EI barriers need to be assessed to identify a transition toward a greener and more sustainable economy in the coming years.

In the phenomenology work in Chapter 3, we identify potential limitations related to the sample and the generalizability of findings. First, in interpretive epistemology, the ability to generalise presents a challenge. Consequently, this method does not permit the establishment of cause-effect relationships, but we believe that a large sample size could enable to use new methods for identifying facial gestures in response to emotions in future research. Methods involving facial microexpressions and linguistic analysis are less intrusive than interviews (Gamache et al., 2020; Shi et al., 2019) and will allow for a broader sample spectrum. Secondly, the study's Spanish context situates the conclusions within specific cultural and educational frameworks. Therefore, examining the emotional experiences of leaders in different contexts and the influence of cultural and educational factors could lead to different conclusions, for example, in Asia, where emotional reactions are more controlled (Hall, 2019). Third, all the emotions we examined are those reported by the leaders. There is also probable that the leaders were not accurately reporting what they felt despite the significant efforts made by the researchers in this regard. In this way, future research could address the emotions of leaders in SMEs within the field of sustainability concerning various stakeholders, such as employees or suppliers. They are highly significant as a leader does not lead alone but as part of a community, which helps them to be more committed to circularity (Yamoah et al., 2022). In this regard, the progression of artificial intelligence could collect data in a more subjective manner without human intervention. However, this borders on breaking data protection policies, which is currently a very controversial topic, at least within the European Union, may never recommend exceeding this limit for the sake of humanity.

Finally, building on the integrative framework of findings, a research agenda is presented with seven topics grouped: (1) Sustainable Barriers, (2) Traits and Emotions of Microfoundations.

Table 12 Future research lines

Sustainable Barriers	Examine leaders' regional and cultural differences regarding perceived barriers to sustainability.
	How do different variables in the leader's context, together with their personality traits, affect overcoming barriers to sustainability?
	To delve deeper into which barriers to sustainability are most common depending on the combination of personality traits and emotions experienced.
Traits and Emotions of Microfoundations	Based on personality traits identify coping strategies to diverse emotions to face diverse barriers to enhance in the adoption of successful strategies to adopt more efficient-EIs.
	Determine under what circumstances leaders, in combination with their traits, are more likely to react more intensely to emotions.
	Explore ways to manage the diverse action tendencies carried because of emotions experienced when face barriers based on personality traits.
	Investigate whether the profiles identified for leader's adoption EI remain valid for a sample of young entrepreneurs and if they can be generalized to any entrepreneurs.

Elaborated by authors.

To sum up, this thesis underscores the necessity that any study that brings us closer to overcoming obstacles and finding approaches that involve lesser impacts on the planet and society is necessary and urgent. Along these lines, Fran Benedito, CEO of ClimateTrade at the UN Climate Change Conference COP28, has stated: "We have a unique opportunity to lead the construction of a more sustainable future and ensure our long-term success" (ClimateTrade, 2023).

This is a call to action for all of us, the academic community, environmental organizations, and policymakers, to take up this responsibility and lead the way.

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Appendixes

Appendix 1. Questionnaire

1. You perceive the TECHNOLOGICAL BARRIER as a limitation when adopting Eco-innovations.

   Refers to aspects such as:

   -Technological incompetence on the part of the company when it comes to absorbing EI developed by others.
   -Complex technological design processes and sophistication in reusing or recycling products and/or reducing the use of resources.
   -Skepticism when it comes to investment in technology, it could happen that there is a low response from the market.

   Strongly disagree 1 2 3 4 5 Totally in agreement

2. You perceive the ECONOMIC AND FINANCIAL BARRIER as a constraint to adopting Eco-innovations.

   Refers to aspects such as:
   -Lack of access to subsidies, tax incentives or bank loans.
   -High costs of waste disposal in general.
   -High costs of changing from the traditional system to a more sustainable system.

   Strongly disagree 1 2 3 4 5 Totally in agreement

3. You perceive the MANAGEMENT, ORGANIZATION AND HUMAN RESOURCES BARRIER as a limitation when adopting Eco-innovations.

   Refers to aspects such as:
   -Lack of commitment on the part of the entrepreneur or company leader, and/or reluctance to shift towards EI practices on the part of the management team.
   -Lack of interaction with government agencies in relation to EI.
   -Lack of training or programs for EI practices brought in from human resources for employees.

   Strongly disagree 1 2 3 4 5 Totally in agreement

4. You perceive the BARRIER OF STAKEHOLDER (CUSTOMERS, SUPPLIERS, GOVERNMENT OR SOCIETY) COLLABORATION AND COMMITMENT as a constraint to adopting Eco-innovations.

   Refers to aspects such as:
   - Unwillingness on the part of your supply chain to share information on EI practices.
   - Poor communication with external partners and lack of clarity on the roles of each in relation to EI adoption.

- Lack of platforms or forums for SMEs to discuss EI.

Strongly disagree 1 2 3 4 5 Totally in agreement

5. You perceive the GOVERNMENT SUPPORT BARRIER as a constraint to adopting Eco-innovations.

   Refers to aspects such as:
   - Rigid and complex rules when adopting EI.
   - Application of environmental policies that favor only a few.
   - Lack of training programs to incorporate EI practices and government support for technological upgrading for SMEs.

   Strongly disagree 1 2 3 4 5 Totally in agreement

6. You perceive the MARKET AND CUSTOMER BARRIER as a constraint to adopting Eco-innovations.

   Refers to aspects such as:
   - Lack of receptivity, awareness and knowledge on the part of customers towards EI products or services.
   - Difficulty in accessing raw materials in the market to produce EI products or services.

   Strongly disagree 1 2 3 4 5 Totally in agreement

7. You perceive the BARRIER OF KNOWLEDGE AND INFORMATION ABOUT EI PRACTICES as a constraint to adopting Eco-innovations.

   Refers to aspects such as:
   - Lack of knowledge about EI practices and legislation on the part of employees and entrepreneurs.
   - Lack of capacity to detect business opportunities and environmental benefits of EI products and services.
   - Lack of knowledge about the possibilities of recycling/reuse and/or reverse logistics (responsible for the recovery and recycling of containers, packaging and hazardous waste; as well as return processes for excess inventory, customer returns, obsolete products and seasonal inventories).

   Strongly disagree 1 2 3 4 5 Totally in agreement

8. Of all the barriers we have explored, which one do you think limits you the most. You can only choose one.

   Degree of transformation towards the adoption of Eco-innovation (EI) fro
9. m THE USER DIMENSION

Refers to these aspects:
-The changes your company undertakes to have the capacity to anticipate the acceptance of EI in the market.
-The changes your company undertakes in order to be able to explore the role of users in the implementation, identification, introduction and development of new EI, benefiting from their creativity.

Strongly disagree 1 2 3 4 5 Totally in agreement

10. Degree of transformation towards the adoption of Eco-innovation (EI) from the PRODUCT/SERVICE DIMENSION.

Refers to these aspects:
- Changing the delivery of the product or service, identifying possible changes in the relationship with your customer by improving EI.

Strongly disagree 1 2 3 4 5 Totally in agreement

11. Degree of transformation towards the adoption of Eco-innovation from THE GOVERNANCE DIMENSION

It refers to these aspects:
- Institutional solutions that have to do with changes in norms and values that can lead to new organizational or structural changes in your company towards better EI practices.

- Public-private collaboration in addressing EI.
- Your company's leaders encourage business-society collaboration on EI practices.

Strongly disagree 1 2 3 4 5 Totally in agreement

12. Degree of transformation towards the adoption of Eco-innovation from the DESIGN DIMENSION

It refers to the following aspect:
-The way you design improvements to your company's existing processes.

Strongly disagree 1 2 3 4 5 Totally in agreement

We will explore the traits you have as a leader.
Strongly disagree 1 2 3 4 5 Totally in agreement (for each)

13. Sympathise with others' feelings
Am not interested in other people's problems. (R)
Feel others' emotions.
Am not really interested in others. (R)

14. Keep in the background. (R)

Am the life of the party.
Don't talk a lot. (R)
Talk to a lot of different people at parties.

15. Get chores done right away.
Often forget to put thingack in their proper place. (R)
Like order.
Make a mess of things. (R)

16. Have frequent mood swings.
Am relaxed most of the time. (R)
Get upset easily.
Seldom feel blue. (R)

17. Have a vivid imagination.
Do not have a good imagination. (R)
Am not interested in abstract ideas. (R)
Have difficulty understanding abstract ideas. (R)

Appendix 2. Table Necessary conditions

	Outcome: Adoption EI (EI)			Outcome: Non adoption EI (~EI)		
	Cons.Nec	**Cov.Nec**	**RoN**	**Cons.Nec**	**Cov.Nec**	**RoN**
BTEC	0.526	0.836	0.875	0.557	0.308	0.623
BFIN	0.845	0.825	0.644	0.809	0.275	0.303
BORG	0.397	0.757	0.866	0.615	0.408	0.727
BCOL	0.549	0.800	0.828	0.711	0.360	0.601
BGOV	0.686	0.767	0.685	0.828	0.322	0.427
BCUS	0.426	0.741	0.838	0.582	0.351	0.674
BKNO	0.661	0.805	0.767	0.711	0.301	0.479
~BTEC	0.565	0.786	0.803	0.704	0.340	0.570
~BFIN	0.257	0.795	0.939	0.485	0.521	0.869
~BORG	0.690	0.838	0.797	0.634	0.268	0.465
~BCOL	0.561	0.848	0.873	0.605	0.318	0.604
~BGOV	0.393	0.868	0.937	0.570	0.257	0.501
~BCUS	0.626	0.812	0.798	0.570	0.257	0.501
~BKNO	0.426	0.809	0.891	0.539	0.356	0.707

Abbreviations: BTEC, technological barrier; BFIN, financial barrier; BORG, internal organisational barrier; BCOL, collaboration barrier; BGOV, government support barrier; BCUS, market and customer barrier; BKNO, knowledge barrier; EI, eco-innovation.

Appendix 3. Table Enhanced conservative solution for the negation of the Eco-innovation

	inclS	PRI	covS	covU
AGR*NEU*CON*~EXT*OPE*~BARN	0.892	0.359	0.204	-

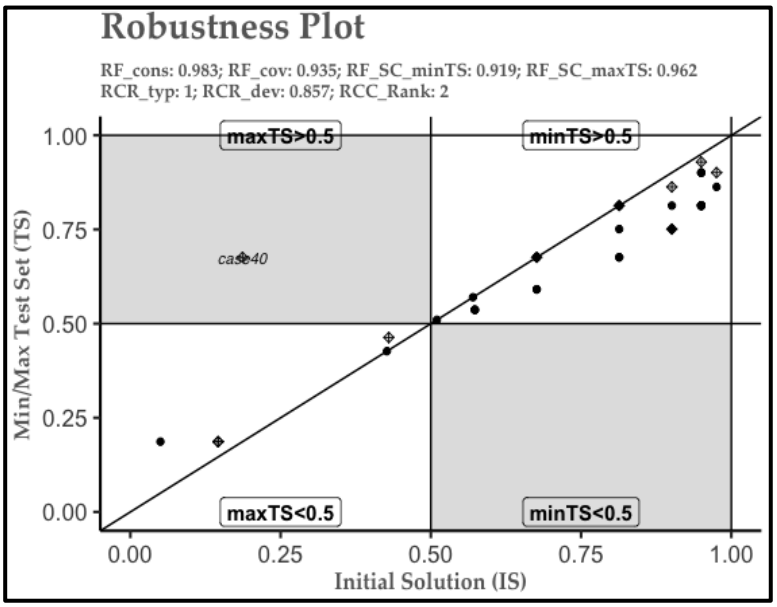
Abbreviations: AGR, agreeableness; CON, conscientiousness; EXT, extraversion; OPE, Openness; NEU, Neuroticism; BARN, necessary barriers: the financial barrier or the negation of the government support barrier.

Appendix 4. Table Skewness

Variable	Skewness check
BTEC	42.5%
BFIN	80%
BORG	37.5%
BCOL	47.5 %
BGOV	70%
BCUS	42.5
BKNO	65%
Set Vble-Cases	> 0.5 / Total number of cases

Abbreviations: BTEC, technological barrier; BFIN, financial barrier; BORG, internal organisational barrier; BCOL, collaboration barrier; BGOV, government support barrier; BCUS, market and customer barrier; BKNO, knowledge barrier.

Appendix 5. Figure Robustness plot for Eco-innovation



Appendix 6. Figure Research Model