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"Sincerity may be humble but she cannot be servile"
(Lord Byron)

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Bringing research to management practice[1]

Bo Edvardsson

Businesses and other organizations exist to create value. We as management scholars also exist to create value by bringing research to practice. Value creation for, whom? Value for customers, owners, partners and the society at large. The old way is understanding value as embedded in units of output - goods and services, while the emerging view understand value as cocreated among collaborating actors in ecosystems. How can we as scholars explain value creation in ways that contribute to management practice? Are we building an Ivory tower by using concepts that are hard to grasp? How can we create value with our research for management practice?

My academic home is Service Research Center - CTF and Karlstad Business School. I have during some time reflected on the essence of how we present research findings for practitioners and design executive programs. I have discussed with leaders from a wide range of businesses, including Volvo and IKEA. I also learnt from participants in executive development courses, and a program at CTF, focusing on bringing service research to practice; Improving value creation through Service Education (ISE), with around 20 online courses. See website: ISE, Improving value creation through service education (kau.se). My experience is that three interdependent aspects of value creation are particularly useful when bringing research to practice as a basis for *Managing value creation.*

1. Understanding what value creation is

Value creation can be understood as systemically, cocreated, actor defined and situation/context dependent. We can also argue that value is an experience and that managing value creation should be focused on creating favorable user experiences.

Value creation cannot be understood by focusing on offerings (goods, services, information), individual brands or firms only. Resources, actors, technology and institutional arrangements in a wider ecosystem is needed to understand what is shaping value creating processes and outcomes. This ecosystem scope is useful if not a necessity to inform management practice and connect to their challenges, and thus our research creates value for managers. They understand the relevance and research enable and support them to better perform their management tasks.

In the travel and hospitality industry, various service providers, such as airlines, hotels, tour operators, and transportation companies, collaborate to create value for customers. For example, a customer planning a vacation might book a flight, reserve a hotel room, arrange for local transportation, wine testing, a concert and purchase sightseeing activities. By integrating these services, the ecosystem creates value by simplifying the travel planning process, reducing customer effort, and enhancing customer experience, but also business value for the different service providers. The integration might be enabled and managed with digital platforms.

Additionally, online travel platforms like Expedia and Booking.com act as intermediaries in value creation processes across ecosystems, to offer convenience and competitive pricing. By providing a single platform for customers to access a wide range of services, these platforms create value by saving customers time and effort in searching and booking individual services as well as managing value creation for the providers point of view

Smart home devices, such as smart thermostats, security systems, and voice assistants, create value by interacting with different service providers and offering enhanced convenience and control to customers. Companies like Amazon (Alexa) and Google (Google Assistant) have developed voice-activated assistants that connect actors to various devices and services. Customers can control their lighting, music, security, temperature in different rooms and even (remotely) order products through voice commands. Many financial services are providing customer with access to a wide range of services; paying bills, buying shares, transferring money, bank loans, providing credit cards etc. These services can be accessed or carried out independent of time and location.

In the above examples, value creation is driven by the integration of multiple service providers' resources (offerings) within and across ecosystems, enabling customers to benefit from individualized experiences. Furthermore, managing integration of value creation processes has shifted from the provider to customers or users. This enables self-customization and activities are carried out by users rather than by employees.

2. Controlling and governing value cocreation

Processes and outcomes; including quality, productivity, experience, circularity and profitability. Firms and other organizations create online customer communities where customers can interact, collaborate, and co-create value. Controlling and governing such value co-creation processes is crucial to ensure intended outcomes and experiences.

LEGO created the LEGO Ideas platform, where customers can submit their own unique designs for LEGO sets. The community members can vote on the designs, and if a design receives enough support, LEGO considers producing it as an official set. LEGO carefully monitors the platform to maintain quality and ensure that designs comply with their guidelines. By controlling and governing the platform, LEGO can effectively harness the collective creativity of their customers and co-create value while maintaining brand integrity.

In business-to-business (B2B) service ecosystems, organizations often establish service level agreements to control and govern value co-creation processes and outcomes. SLAs define the agreed-upon terms, metrics, and responsibilities for delivering services between the provider and the customer. They serve as performance benchmarks and contractual obligations, controlling that the value created meets the expectations of engaged actors. Cloud service providers like Amazon Web Services (AWS) offer SLAs that control and specify uptime guarantees, response times for support requests, and data security measures.

These examples highlight the importance of controlling and governing value co-creation processes and outcomes in service actors' ecosystems. By implementing monitoring mechanisms, establishing guidelines, and defining performance expectations, organizations can maintain the desired direction and quality of the co-creation efforts, leading to enhanced value for both the customers and the organization

3. Renewing value creation through innovation

Renewing value creation through innovation involves identifying and capitalizing on emerging trends, technologies, and customer engagement and needs. Innovation means looking at reality and rearranging the set of collaborating actors and orchestrating resources into new value creating ecosystem configurations. Innovation through robots is improving the creation of value not only in manufacturing, but also in sectors such as healthcare and hospitality. Value creation is also renewed through platform-based innovation ecosystems. A platform-based innovation ecosystem links multiple markets and their corresponding stakeholders for joint value creation and innovation around a platform. Studies on innovation have shown that the introduction of a platform to an ICT market typically causes major change in the market structures and value cocreation processes.

We benefit today from earlier innovations and the stream of innovations are continuously improving value creation. We all know the iPhone, which disrupted the mobile phone industry by combining features such as a touchscreen interface, internet connectivity, and a variety of multimedia capabilities in one device. Apple's ability to anticipate customer experiences, design sleek and intuitive user interfaces, and create an ecosystem of complementary products and services has allowed them to continuously renew value creation. Another example is Tesla. By continuously pushing the boundaries of what is possible in EV technology, Tesla has catalyzed a shift towards sustainable transportation and redefined the value proposition in the automotive industry, and the transformation is ongoing.

Value creation is also renewed through platform-based innovation ecosystems. A platform-based innovation ecosystem links multiple markets and their corresponding stakeholders for joint value creation and innovation around a platform. Studies on innovation have shown that the introduction of a platform to an ICT market typically causes major change in the market structures and value cocreation processes. Artificial intelligence (AI) continues to reshape economic landscapes and thus value creation with profound implications and the transformative nature of machine learning, with innovative algorithms and data-driven insights shape unprecedented value creation across industries. The now rapid development is inviting us management scholars to ponder the future, where human ingenuity and artificial intelligence converge to redefine civilization's trajectory. Healthcare innovations embrace AI for diagnostics and personalized medicine, while the financial sector increasingly relies on innovative algorithms for improved fraud detection and risk assessment. In retail, businesses utilize recommendation systems powered by machine learning to tailor experiences, enhancing customer satisfaction and driving sales. As the use of innovative AI technologies is necessitating an understanding of not only their functionalities but also the social, ethical and philosophical questions that accompany their deployment.

The examples above highlight how organizations can renew value creation in a wide range of ways by identifying untapped opportunities, leverage emerging technologies, and reimagine traditional industries.

Conclusion

All organizations exist to create value for themselves and others. As management scholars, we also exist to create value and have a responsibility to present our research in ways that are useful for management practice. I have in this editorial argued that we have a responsibility to bring and connect our research to management practice. We can, and to better that, do more to support managers and connect to their burning questions and challenges. If we show how our findings contribute to better understand and manage Value creation, we will improve the impact of our research. Share your experiences. Let us continue this discussion!

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Best Papers

The interplay between perceived quality and sustainability attitudes in consumers' modal choice in local transportation[1]

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Valeria Faralla - Graziano Abrate - Giovanni Fraquelli

Abstract

Frame of the research*.* *Modal choice in urban and inter-urban mobility holds a significant potential impact on sustainable well-being across multiple dimensions (e.g. environmental impact, health, social equity). The reliance on private modes of transport has been associated with negative effects for individuals and society at large, but at the same time it is crucial to understand consumers' attitudes and their willingness to shift towards more environmentally friendly modes of transportation, such as local public transport.*

Purpose of the paper. *The purpose of the study is to investigate the motivations and strategies that favour a modal shift from the use of private cars to local public transport, focusing on the role of two main multidimensional and interconnected factors: perceived quality and individual sustainability attitudes. The consumers' perspective is integrated with that of the managers of the local public transport supply to derive meaningful implications.*

Methodology*. The research employed both quantitative and qualitative methods, including a self-reported survey targeting mobility consumers, from which 542 responses were collected. Additionally, 15 semi-structured interviews were conducted with operators of local public transport services.*

Results*. The findings suggest that perception of quality differs for high and low levels of sustainability attitudes. We also found differences in these attitudes for users and non-users. Environmental attitudes also differed according to time preference. Strategies for modal shift were found to be heterogeneous and context-dependent. Our research findings can provide guidance for enhancing the appeal of local public transport for both current users and non-users with important implications in terms of sustainability and well-being for individuals and communities.*

[1] *Acknowledgements*
We gratefully acknowledge the funding support provided by ASSTRA, the Transportation Association, HERMES, Higher Education and Research on Mobility Regulation, and the Economics of Local Services. We also thank the University of Piemonte Orientale for its assistance in administering the questionnaire as well as all the interviewees who participated in the qualitative study, particularly the City of Novara's Mobility Planning Department, which was the first to accept our interview request. Finally, we extend our thanks to the two anonymous reviewers of the Sinergie-SIMA Management Conference 2024 for their valuable comments, which significantly improved the paper.

Research limitations. *The empirical analysis can be extended by integrating revealed and stated preference techniques, allowing for a direct discrimination between the use of public and private modes, particularly from the perspective of non-users. Additionally, the data examined in this study, consisting of a sample of consumers and interviews with some managers, may limit the generalizability of results. Future research could address this limitation by utilizing a more representative sample.*

Managerial implications. *The current study presents an integrated approach, combining various managerial policies that concurrently promote improvements in service quality, use of sustainable approaches, and long-term planning. This approach aims to create a synergistic effect that facilitates modal shift.*

Originality of the paper. *The paper contributes to the general debate on how to promote well-being in a sustainable manner, highlighting the application of behavioural insights to the case of modal choice in local transportation. In particular, it proposes an empirical investigation that integrates the consumers' view with that of local public transport actors. To the best of our knowledge, this study represents one of the first attempts to simultaneously examine perception of quality, sustainable attitudes, and time preferences.*

Keywords*: modal shift; perceived quality; revealed preference; socio-environmental attitudes; sustainable well-being*

1. Introduction

Air quality in European cities has been slowly increasing. Air pollution extends beyond environmental concerns. Elevated concentrations of key air pollutants have been implicated in numerous health issues, contributing to overall population vulnerability and the deterioration in the well-being of individuals and society. According to the European Environment Agency (2022a) "air pollution is the greatest single environmental health risk in the EU" and "around 96% of the EU's urban population remains exposed to levels of fine particulate matter that damage health". Although there is no single cause, pollution from emissions is largely attributed to road transport and urban traffic that rely heavily on private vehicles. According to the Organization for Economic Cooperation and Development (OECD, 2023, p. 3) "on average, energy industries generate 28% of greenhouse gas emissions in OECD countries, followed by transport (23%), manufacturing industries (12%), agriculture (10%), industrial processes (7%), and waste (3%). While the share of emissions from energy industries have slightly decreased since 2005, those from transport and agriculture increased".

The use of private cars is linked to many negative aspects other than air pollution that affect the urban environment, such as congestion, use of physical space, lack of parking space, and noise. For instance, excessive noise from transportation has adverse effects on human health and disproportionately affects those living in urban areas. According to the European Environment Agency (2022b), individuals with lower socioeconomic status are more affected by pollution. This contributes to inequality in pollution exposure and negatively affects well-being (Fleurbaey *et al.*, 2014) and social justice (Hanratty and Farmer, 2012), and the use of electric vehicles may not sufficiently reduce these negative effects.

The use of public transport can reduce gas emission, relieve congestion, and enhance overall well-being as a broad concept: "a perspective on a good life that comprises access to basic materials for a good life, freedom and choice, health and physical well-being, good social relations, security, peace of mind and spiritual experience" (Díaz *et al.*, 2015, p 14). According to this view, well-being is a holistic concept that encompasses more than the economic dimension of human development. A strong connection exists between well-being, nature, and ecosystems (Roberts *et al.*, 2015) and also strong pro-social preferences (Bartolini, 2014; Bartolini and Sarracino, 2014; Camerer, 2011; Helliwell and Putnam, 2004). Innovative and sustainable business paradigms have recently been discussed by Kitchen (2020) and Tencati and Pogutz (2015). At present, the integration of the principles of sustainability with well-being is increasingly needed to balance the heterogeneity of the needs of present and future generations with the preservation of the integrity of natural resources. This has recently been defined as sustainable well-being (Hellström *et al.*, 2015; Helne and Hirvilammi, 2015; O'Mahony, 2022).

Starting from this framework, different types of intervention must be implemented to reduce the use of private vehicles and promote a modal shift to local public transport (LPT) which is considered a more sustainable means of transport. The relevance of this topic has been highlighted by Mattia *et al.* (2019) and Miramontes *et al.* (2017) in the context of shared and multimodal mobility. Guglielmetti Mugion *et al.* (2018) also found that service quality directly impacts the intention to increase public transport use, whereas De Cet *et al.* (2024) emphasised the growing need to reduce the negative externalities of private transport and pursue a balance between the environmental, economic, and social dimensions.

In this study, we investigated the relationship between modal shifts, perceived quality, and sustainability attitudes toward LPT using both quantitative and qualitative data. This study explores how perceived quality and individual sustainability attitudes influence modal shifts and interact with each other, how sustainability attitudes vary between users and non-users of LPT, how time preferences influence environmental attitudes, and what strategies can effectively promote a modal shift from the use of private cars to LPT.

First, we consider an efficient and high-quality transportation system as an essential starting point for a modal shift (Fraquelli, 2021). Moreover, we believe that pro-environmental or pro-social attitudes play a major role in choosing less impactful means of transportation (Nilsson and Küller, 2000). An online survey was used to collect information on modal choice patterns, and a revealed-preference set of questions was used to explore the characteristics of LPT trips, particularly the perceived quality of the service. In the online questionnaire, we collected data on sustainability attitudes in terms of the environmental and social well-being impacts of transport modes. Furthermore, considering that the choice of transport mode can be strongly influenced by habit formation in consumption preferences, we include a time-preference measure. Individuals with low time preference may have greater self-control and be better able to delay gratification for sustainable purposes. Next, we conducted semi-structured interviews with LPT actors to deepen our understanding of the motivations for the modal shift towards LPT. Overall, our research findings can increase the attractiveness of LPT for both users and non-users with a possible reduction of environmental impact and increased awareness of the positive effects on sustainability and well-being for individuals and communities.

2. Literature review

Individual decision-making in the transportation realm displays significant heterogeneity. According to classical theory, consumers choose the mode of transfer that maximises their utility, given their budget constraints and preferences. Nevertheless, the roles of psychological, social, and environmental factors in shaping modal choice behaviour have become prominent in recent years (Devika *et al.*, 2020; Mattauch *et al.*, 2016). Sociodemographic factors such as age and income can also play a role in the consumption preference for transport (Muhtadi *et al.*, 2020).

Modal choice involves considering accessibility, costs, and travel time. Understanding one's own preferences may be difficult to address and may give rise to a possible cognitive bias that negatively affects the relationship between decision-making and well-being (Kahneman, 2003; Thaler and Sunstein, 2008). Furthermore, laboratory and field experiments have revealed the importance of attitudes and behavioural patterns in predicting modal choices (John, 2017; Kahneman, 2003). Individuals may acquire habitual models based on past experiences and social influences (Duhigg, 2013) which can be difficult to break. The demand for public transport services can be significantly influenced by various subjective factors. This study explored the impact of perceived service quality, sustainability attitudes, and time preference on individual choices.

Service quality attributes have been grouped into eight areas: availability, accessibility, information, time, customer care, comfort, safety, and environmental impact (European Committee for Standardisation (CEN), 2002). These attributes have been investigated extensively (for a review, see Ojo, 2019), particularly using stated and revealed-preference methods (Bourgeat, 2015). The results show that perceived service quality is very important in promoting and facilitating the use of public transport (Fraquelli, 2021) and, in association with certain service attributes such as timetables or comfort, is particularly helpful in engaging new users (Levinger and McGehee, 2008). Service quality also influences behavioural intentions and loyalty (de Oña, 2021). Nevertheless, subjective quality can significantly influence modal choice in the absence of objective measures (Eboli and Mazzulla, 2012). Moreover, when a cognitive bias is involved, a change in the quality of the services alone does not necessarily support the use of public transport. For instance, satisfaction with public transportation systems tends to be underestimated by car-use habits (Pedersen *et al.*, 2011). Heterogeneity between users and potential user preferences has also been observed (Bellizzi *et al.*, 2020).

The segmentation of travel consumers into groups with similar attitudes has been used to promote sustainable transport. For instance, Haustein and Hunecke (2013) demonstrated that attitude-based segmentation can predict modal choices and support interventions for the reduction of car use. More specifically, environmental and social attitudes seem to be connected to both the use of personal transport and the increase in public transport (Anable, 2005; Avineri and Goodwin, 2010; Cassar, 2023; Giubergia *et al.*, 2023; Nilsson and Küller, 2000). Pro-environmental individuals may be more likely to choose environmentally friendly transportation modes such as public transport, walking, or cycling, particularly when informed about the impact of their transport choices (Lehner *et al.*, 2016). Anable (2005) reported that environmental attitudes and ecological norms can help reduce car travel and that social value orientation also plays a strong role in car use. A highly sustainable attitude may enhance the use of LPT through service quality. Borhan *et al.* (2014) show that the perception of quality differs between high and low levels of sustainability. One may suppose that these attitudes differ between users and non-users.

Finally, as noted earlier, a low time preference may lead to increased engagement in long-term benefit plans (O'Donoghue and Rabin, 1999). This finding has important implications in terms of sustainable mode choice, considering that future planning typically plays a strong role in environmental and social well-being policies. In contrast, high time preference can be related to present bias and self-control issues which can promote the assignment of greater weight to rewards that are closer in time and affect the cost-benefit analysis when considering the varying effort required by alternative transport modes (Mattauch *et al.*, 2016). In addition, a lack of self-control can prevent time-consistent preferences (Frederick *et al.*, 2002), and a return to old habits is possible, considering that individuals often rely on default effects and are affected by inertia (Fujii and Kitamura, 2003) when choosing travel options. Additionally, individuals with high- and low-level environmental concerns may have different patterns of subjective time perception (Franzen and Vogl, 2013; Schaub, 2022).

By delving into the themes presented, a deeper understanding of the factors that influence modal shifts can be attained. This is essential for designing efficient and quality transportation systems that are environmentally and socially sustainable with the aim of enhancing overall well-being at the individual, societal, and institutional levels. The link between well-being and sustainability is complex, particularly in the context of urban mobility. Sustainable well-being requires the integration of social, environmental, and economic aspects, reflecting the need for a balance between these systems. Specifically, the sustainable well-being approach recognises the need to shift from material growth to alternative goals that support both environmental and social welfare for individuals and communities. This entails a range of actions, such as reducing environmental pressures, addressing poverty, and promoting intra-generational equity in a framework that encompasses the cultural, spiritual, and psychological benefits derived from ecosystems (O'Mahony, 2022).

Modal choice is an example of how transportation affects environmental quality and economic and social well-being. Given the different nuances of this topic, a multidimensional approach is essential for understanding how modal choice sustainably impacts different dimensions of well-being. This study contributes to this comprehensive perspective by integrating perceived quality, sustainability attitudes, and managerial strategies rather than considering these concepts in isolation. Furthermore, investigating the interplay between quality, sustainability, and consumer choices in local transportation has significant relevance to several Sustainable Development Goals (SDGs) (United Nations General Assembly Resolution 70/1, 2015), particularly good health and well-being (SDG 3), sustainable cities and communities (SDG 11), climate action (SDG 13), and responsible consumption and production (SDG 12).

The shift from private to public transportation plays a crucial role in achieving SDG 3 by improving road safety and lowering hazardous air pollution levels and may promote good health and well-being at all ages. Simultaneously, in line with SDG 11, enhancing the quality and accessibility of LPT aims to make cities more inclusive, safe, and sustainable by mitigating urban challenges such as congestion and environmental pollution. This study also provides a deeper understanding of what increases the appeal of LPT for both users and non-users. Moreover, regarding climate action (SDG 13), the present findings may improve policy recommendations aimed at reducing carbon emissions in urban transportation systems by examining the motivations and strategies that favour a modal shift towards public transport. Additionally, this study offers a comprehensive approach that integrates consumer insights and managerial perspectives from LPT operators, promoting a synergistic approach to climate action. Finally, regarding SDG 12, this study sheds light on how sustainable attitudes influence modal choice and provides recommendations for policymakers to develop strategies that can promote responsible consumption through environmentally friendly mobility options, ensuring that people are aware of relevant information for choosing a sustainable development approach in their lifestyles. Therefore, transport service providers should be encouraged to improve their sustainability reporting and adopt green practices.

As underlined by Rasmussen *et al.* (2023, p. 2) "modal shifts take place when the decisions of individuals, known as behaviour, change […] promoting modal shifts by targeted policies requires an understanding of individual travellers' motives as preconditions for fulfilling needs and avoiding barriers". In particular, this study explored the relationship between modal shifts and subjective factors. Understanding modal shift dynamics and identifying strategies to promote more sustainable transportation modes are essential for creating efficient, equitable, and environmentally sustainable transportation systems that meet the needs of present and future generations and for designing effective communication.

3. Research methodology

3.1 Self-reported survey on mobility consumers

We used data from an online survey on LPT conducted among members of a university community in northern Italy.

The survey was conducted using Qualtrics XM (https://www.qualtrics.com). Respondents received an invitation to participate via email using the newsletter of the staff and the communication office. The survey was conducted from June 26 to July 20, 2023. A reminder email was sent approximately two weeks later. The questionnaire was anonymous, and participation was voluntary. A total of 542 participants completed the questionnaire. The sample size is in line with those used in transportation studies dealing with similar areas of research (Lizana *et al.*, 2021; Nesheli *et al.*, 2016). The response rates of students, professors, and administrative staff were approximately 13%, 20%, and 28%, respectively.

3.2 Questionnaire design

All participants were presented with a disclaimer regarding the questionnaire and privacy policy. After the disclaimer was accepted, the participants were faced with three different sections: modal choice, a revealed-preference survey on perceived quality, social-environmental sustainability attitudes and time perception, and socio-demographics. The data were analysed using R x64 4.3.0 (R Core Team, 2023). The open responses were examined using word clouds. To generate word clouds, the responses were pre-processed (Eldeeb *et al.*, 2023) using normalisation, stop word and punctuation removal, tokenisation, stemming, unnecessary word removal (e.g. city names, km), and Italian to English translations.

3.2.1 Modal choice and revealed-preference survey on perceived quality

In the first part of the survey, participants were instructed to provide basic information about their modal transfer and their level of satisfaction with it. We also asked respondents to provide information about their use of LPT in the long-term (10-point Likert scale from 1 = not at all likely to 10 = extremely likely).

Participants who reported using LPT (we excluded those who stated that they never used LPT and classified them as "non-users") were asked to report the type, reason, and satisfaction relative to the main means of transport used. We then presented a revealed-preference set of questions that explored the characteristics of their last LPT trip. More specifically, respondents were asked the (1) date, time, duration, and purpose of their last trip; (2) type of LPT and mean to source and from destination stops used; (3) type of ticket, (4) general level of satisfaction (10-point Likert scale from 1 = very unsatisfied to 10 = very satisfied), and (5) evaluation of ten specific items that typically characterise the service quality (10-point Likert scale from 1 = not at all important to 10 = very important). The ten items that the subjects were required to evaluate on their last trip to characterise service quality were frequency, punctuality, comfort, cleanliness, personal security, information, staff, other passengers' behaviour, intermodality, and ticket price (1 = cheap to 10 = too expensive). We refer to these variables as perceived quality items (Fraquelli, 2021). We added an item for disabled people services which allowed an answer "not applicable". As only approximately 50% of the subjects responded to this question, we analysed this item separately. At the end of the revealed-preferences section, the participants were asked to indicate the three most important parameters among the ten attributes.

Finally, for all participants, including non-users, four open-ended items about the main reason for using or not using LPT and private transportation mode (i.e. cars) were included in this section. The open-ended questions were intended for general feedback, and because non-users have no experience with the use of LPT, they were asked why they would prefer LPT over an individual transport mode.

We tested the effectiveness of the service quality attributes in the questionnaire by applying Cronbach's alpha as a measure of internal consistency which was equal to 0.90, indicating optimal internal consistency and reliability of the scale items. Moreover, using the ten perceived service items as regressors and the general level of satisfaction with the last trip as the dependent variable, we implemented an ordinal logistic model. The base for the independent variables was set by considering the mean value of the results obtained for the perceived quality items.

3.2.2 Sustainability attitudes and time perception

First, an assessment of all participants' concerns about global warming was administered (10-point Likert scale ranging from 1 = not at all concerned to 10 = very concerned). Second, the importance of the environmental and the social well-being impact of the selected transfer mode was evaluated (1 = not at all important to 10 = very important). Third, a time perception assessment randomised across participants concluded this part of the survey. Following Zauberman *et al.* (2009), we examined the respondents' subjective time which is an individual's estimate of the duration between today and the future. The time-perception task was randomised across participants. Respondents were asked to estimate the distance between today and the future (three months, one year, or, alternatively, three years) on a 180-point scale. The task was particularly aimed at eliciting the subjects' behavioural patterns in terms of impatience and combining the results with their environmental attitudes. Pro-environmental behaviour has been found to correlate with delay discounting and plays a role in intertemporal trade-offs and time perspectives (Hirsh *et al.*, 2015). To this end, participants were considered high- or low-importance individuals based on their responses regarding the importance of the environmental impact of their selected transfer mode. Ten participants were excluded because of non-response or misunderstanding.

3.2.3 Socio-demographics

The final section of the questionnaire mostly covered standard socio-demographic and economic items (e.g. gender, age, education, and income). However, additional questions, such as area of residence, use of smart working, and ownership of a driver's licence, were included. The participants were also asked about their role in the university community. Table 1 presents the descriptive statistics. The sample comprised 63% females, and the participants' mean age was 34.64 years (SD = 14.21). Furthermore, 31% live in peri-urban or rural areas, and 53% did not work remotely, suggesting that they had to travel to their workplace. The sample was evenly distributed among students (56%) and non-students (professors, administrative staff, and others: 44%). Almost all participants had a driver's licence (94%), and most were private car owners (68%). Moreover, the income level was mostly low to medium (47%), and approximately 50% had higher-level educations. Approximately half of the participants were considered frequent users, with 48.34% using the LPT daily, very often, or rather often. The groups reporting occasional/circumstantial (i.e. sporadic users) or non-users of LPT were much lower (29.34% and 22.32%, respectively). The percentages of users (frequent, sporadic, and non-users) are reported in Table 1.

3.3 Semi-structured interviews with LPT operators

We also developed semi-structured interviews to be administered to executives and managers of LPT companies (four interviews), executives and managers of public administrations at various levels (municipal: three interviews; regional/provincial: four interviews), associations, and LPT experts (four interviews). Interviews were conducted in three cities located near the university. The interview protocol included five questions related to effectiveness/efficiency measures, cost management, service quality, references to other realities and/or possible partnerships, strategies for potential users, and development plans. Given that the primary objective of the interviews was to uncover the reasons and motivations for the modal shift towards LPT, our attention was directed towards these findings. All the interviewees signed a privacy disclaimer.

Fifteen interviews were conducted from July to December 2023 with an average duration of 45 min. Eight interviews were conducted in person and seven were conducted online. The interviews took place in private rooms or via secure videoconferencing platforms (MS Teams). Thirteen of the 15 interviews were audio-recorded and transcribed verbatim. Following Creswell and Creswell (2018), the analysis included familiarisation with the data through repeated reading of transcripts, the generation of thematic codes (defining and naming themes), reviewing and refining themes, and interpretation of findings.

Tab. 1: Descriptive statistics of socio-demographic variables of the sample

Characteristic	Category	Statistics
1. Area of residence	1 City centre 2 Periphery 3 Suburban 4 Peri-urban/rural	32.47% 26.38% 9.96% 31.18%
2. Time at residence	1 1 year 2 Between 2 and 5 years 3 Between 6 and 10 years 4 More than 10 years	6.46% 9.23% 7.38% 76.94%
3. Gender	1 Female 2 Male 3 Non-binary 4 No answer	62.73% 32.66% 0.74% 3.87%
4. Age		Mean = 34.64 SD = 14.21
5. Educational level	1 Elementary school 2 Middle school 3 High school diploma 4 Bachelor's degree 5 Master's degree 6 PhD 7 Other 8 No answer	- 0.55% 43.54% 17.53% 17.90% 15.31% 4.98% 0.18%
6. Employment status	1 Administrative staff 2 Professor 3 Student 4 Other 5 No answer	18.08% 16.05% 55.72% 9.41% 0.74%
7. Remote working	1 Yes 2 No 3 Sporadically 4 Not applicable 5 No answer	8.30% 52.95% 16.42% 22.14% 0.18%
8. Family members	1 1 2 2 3 3 4 4 5 5 or more 6 No answer	12.55% 19.56% 26.20% 30.63% 10.70% 0.37%
9. Driver's licence	1 Yes 2 No	93.73% 6.27%
10. Private car	1 Yes 2 No	68.45% 31.55%
11. Income level	1 Low 2 Between low and medium 3 Between medium and high 4 High 5 No answer	19.74% 47.23% 29.34% 2.77% 0.92%
12. Type of user	1 Frequent user (daily, very often, rather often) 2 Sporadic user (occasionally, circumstantial) 3 Non-user (never)	48.34% 29.34% 22.32%

Source: our elaboration

4. Results

4.1 Self-reported survey on mobility consumers

4.1.1 Modal choice results

Among all the means of transport used by respondents, cars foot, and trains were the most frequent occurrences. Regarding the main means of transport, cars and trains were the most frequently selected.

The median level of satisfaction with the mean transport used was 6.72 (SD = 2.35, mode = 7 (17.90%), 10-point scale). Moreover, as predicted, non-users will rarely use LPT in the future (mean = 2.27, SD = 2.15, mode =1 (13.47%), 10-point scale). The long-term use of LPT by frequent users was quite high (mean = 7.39, SD = 2.28, mode = 10 (10.89%), 10-point scale) and medium for sporadic users who were more undecided about using LPT in the future (mean = 5.24, SD = 2.15, mode = 6 (4.98%), 10-point scale).

The main purpose for participants using LPT (N = 421 out of 542) was to travel to their study or work destination, and trains and buses were the most frequently selected means of LPT. The mean level of general satisfaction with LPT was 5.52 (SD = 2.08, mode = 6 (21.38%) on a 10-point scale). This suggests that the level of satisfaction was insufficient.

Finally, all subjects were asked to report their main reasons for not using LPT and for using or not using a private car. Frequent and sporadic users were also asked about their purpose of using public transport, whereas non-users were asked about possible reasons for switching transfer modes from private to public. The last two questions were combined into one question (i.e. LPT use). As noted earlier, we used open-ended questions for general feedback and generated four different word clouds, one for each open-ended question to illustrate the participants' main responses (Fig. 1; words with the largest size appeared most frequently).

Regarding the non-use of LPT, respondents mainly referred to timetables and time in general, underlying a general concern about being late and/or finding an appropriate schedule. The use of cars is definitely tied to comfort, whereas their non-use seems to be related to parking issues and maintenance costs. Finally, the use of LPT was reported in reference to work and study, suggesting that the participants preferred LPT to reach the university campus. Among the reasons for using LPT, one of the recurrent responses was "nothing", indicating that some respondents (i.e. non-users) struggled to find a simple or clear reason for using local public services.

Fig. 1: Word clouds for: (1) LPT use (upper-left panel), (2) LPT non-use (upper-right panel), (3) car use (lower-left panel), and (4) car non-use (lower-right panel)

Source: our elaboration

4.1.2 Perceived quality results

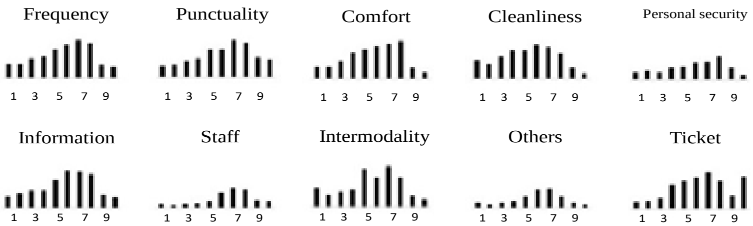
For participants who reported using LPT, we administered a revealed-preference survey on their last LPT trip. Three subjects were eliminated because they referred to a last trip that was not made using the LPT (i.e. car or by foot). Table 2 displays the general characteristics of the last trip as described by the respondents. The main purpose of the last trip was to university or work, and the train was the most used means of transport, followed by bus, metro, and tram. These results are consistent with the main purpose of general LPT use. The mean level of satisfaction with the last trip was 5.81 (SD = 2.00, mode = 6 (21.29%), 10-point scale). For disabled people, the mean score was 5.48 (SD = 2.44, mode = 6 (19.31%), 10-point scale).

The summary statistics of the ten service quality attributes as perceived by the respondents for their last trip are presented in Table 3, and the distribution of the items is presented in Fig. 2. The average rating for the different items was between 5.22 (cleanliness) and 6.65 (staff), with only three items achieving sufficiency (staff, ticket price, and punctuality). Table 4 presents the ordinal logistic model outputs. Except for the staff variable, all items proved to be significant. The coefficients were positive except for price which had a negative effect on the dependent variable.

We built a perceptual map to visually determine the critical gaps in the last trip experience (Fig. 3; for perceptual mapping as a marketing research tool, see Palmatier and Crecelius, 2019; Schmalensee and Thisse, 1988). We set the relative importance of the ten perceived items on the vertical axis and the mean level of satisfaction with them on the horizontal axis (10-point score). The relative importance of the ten items was derived from the participants' responses regarding the three most important parameters among the ten attributes. The ticket price score was reversed (from 1 = too expensive to 10 = cheap) so that all items were represented in the map in a lower-to-higher order. The map was divided into four quadrants: Invest, Communicate, Control, and Maintain. The Invest quadrant includes crucial aspects that are not fully appreciated and require investment, and the Communicate quadrant includes aspects that are appreciated but require additional communication strategies. In the Control and Maintain quadrants, we identify the aspects that need to be checked (Control) or preserved (Maintain).

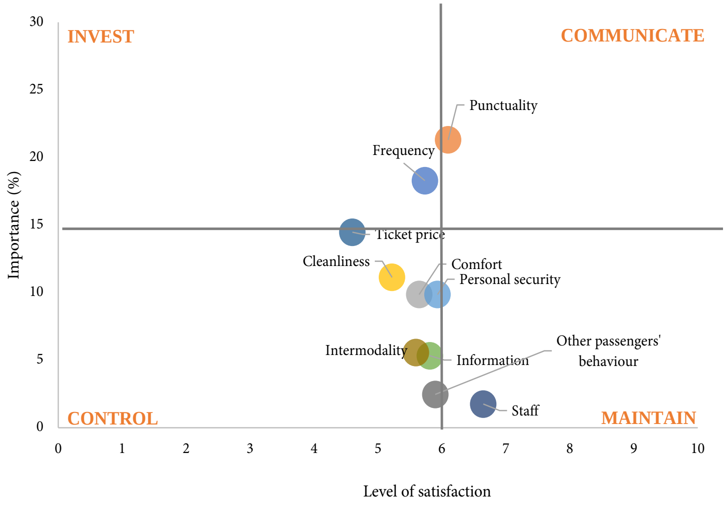
As shown in Fig. 3, punctuality, frequency, and ticket prices were treated differently than the other seven items. These three items were rated as the most important parameters (21.30%, 18.28%, and 14.47%, respectively; see Table 3, last column) and were visually distant from other perceived quality attributes on the map. First, punctuality is located between the Communicate and Invest. This suggests that this quality attribute is important but is not fully appreciated by the respondents. Prejudice regarding the lack of punctuality in LPT services is common; however, the survey revealed that this attribute achieved on average a sufficient score. Thus, an investment in communication strategies may be the first step in reducing a priori negative perceptions and increasing the attractiveness of public services. Frequency was the second most important attribute, and its evaluation was below the reference point; consequently, it is an attribute that requires the investment of resources. Third, the ticket price is located between Control and Invest. On average, LPT services were evaluated as too expensive, despite the fact that alternative travel modes are usually more expensive. However, interventions aimed at maintaining control of ticket prices may be sufficient. Implementing an intervention to improve the frequency of LPT and reduce ticket prices would be challenging. Fourth, staff was the only item that was completely located in the Maintain quadrant, suggesting that this attribute is not of particular interest to the respondents (in both the regression and the question regarding the most important parameters) (Table 3). In line with this view, it seems sufficient to maintain the actual level. Finally, despite being at different levels, the remaining items are in the Control quadrant, suggesting that they are critical issues, particularly cleanliness, comfort, and intermodality, and need to be checked by transport managers. Personal security, information, and other passenger behaviours are near the Maintain quadrant, and minimal effort would be necessary to switch those attributes to the Maintain quadrant.

Fig. 2: Distribution of perceived quality items on the last trip (10-point scale)



Source: our elaboration

Fig. 3: Perceptual map



Source: our elaboration

Tab. 2: Last trip as described by respondents

Characteristic	Statistics
Date (main response)	June and July, 2023
Time (main response)	7:00 and 9:00 a.m.
Duration (main response)	1 hour
Mean	Train: 62.44% Bus: 30.62% Metro: 5.26% Tram: 0.72% Other: 0.96%
Main purpose	Work: 30.14% Study: 48.09% Family management: 4.78% Shopping: 0.48% Free time: 14.11% Other: 2.39%
Ticket	Single ticket: 32.20% Round-trip ticket: 26.08% One-day pass: 1.44% Season pass: 37.56% Other: 2.63%

Source: our elaboration

Tab. 3: Summary statistics of perceived quality items on last trip (10-point scale)

Characteristic	Mean	SD	Mode	Mode %	Importance %[a]
1. Frequency	5.73	2.40	7	16.99	18.28
2. Punctuality	6.10	2.47	7	16.99	21.30
3. Comfort	5.64	2.28	8	17.22	9.86
4. Cleanliness	5.22	2.37	6	15.31	11.13
5. Personal security	5.93	2.43	8	19.14	9.86
6. Information	5.81	2.36	6	16.99	5.33
7. Staff	6.65	2.15	7	22.25	1.75
8. Other passengers' behaviour	5.89	2.16	7	21.77	2.46
9. Intermodality	5.59	2.38	7	18.66	5.56
10. Ticket price	6.40	2.42	7	16.75	14.47

[a] This column refers to the question surveying the three most important parameters among the ten attributes.

Source: our elaboration

Tab. 4: Ordinal logistic model output
(dependent variable = satisfaction with the last trip)

Perceived quality item (base = 1-6)	Coeff.	Std. Error	t-value	p-value
1. Frequency	1.48	0.27	5.57	<0.001
2. Punctuality	1.40	0.26	5.40	<0.001
3. Comfort	0.61	0.30	2.04	<0.05
4. Cleanliness	1.06	0.30	3.54	<0.001
5. Personal security	1.04	0.28	3.75	<0.001
6. Information	1.18	0.25	4.74	<0.001
7. Staff	0.25	0.25	1.03	=0.30
8. Other passengers' behaviour	0.64	0.25	2.54	<0.05
9. Intermodality	0.90	0.26	3.51	<0.001
10. Ticket price	-0.54	0.18	-2.91	<0.01
Residual Deviance	*1211.28*			
AIC	*1249.28*			
McFadden Pseudo R-squared	*0.30*			
Number of observations	*418*			

Source: our elaboration

4.1.3 Sustainability attitudes results

Sustainability attitudes were analysed using three different approaches. First, we investigated the perceived quality of LPT services by jointly considering the role of respondents' attitudes in terms of social well-being and the environmental impact of their selected transfer mode. Concerns about global warming were also raised.

Moreover, sustainability attitudes were crossed with modal choices. In particular, we examined the types of users: frequent, sporadic, and non-users.

Finally, an exploratory analysis was conducted to assess the relationship between the participants' environmental attitudes and their subjective time perception.

As noted earlier, sustainability attitudes may play a role in all three different approaches used: (1) perception of quality may differ for high and low levels of sustainability attitudes; (2) sustainability attitudes may differ according to the type of user; and (3) individuals with high- and low-level environmental concerns may have a different pattern of subjective time perception.

4.1.3.1 Sustainability attitudes and perceived quality

To assess the relationship between the participants' overall evaluation of the ten perceived service quality items and their attitudes regarding global warming, social well-being, and the environmental impact of their selected transfer mode, we used the mean value of the ten perceived quality items as dependent variables. Participants were simultaneously profiled regarding their sustainability attitudes. Specifically, they were treated as factors with two levels: high- or low-concern individuals for global warming and high- or low-importance individuals for environmental and social well-being. Owing to numerosity, the cutoff was set to seven on a 10-point scale (summary statistics for sustainable attitudes are reported in Table 5). We then computed a non-parametric test of group differences (i.e. the Mann-Whitney U test) between the mean value and the three constructed dichotomous variables. The results suggest that being more or less concerned about global warming did not influence the perceived quality results ($p = 0.19$). Nevertheless, the importance assigned to the environmental and social well-being of the selected transfer mode significantly influenced the overall perceived service quality ($p < 0.01$ and $p < 0.001$, respectively). Notably, for both environmental and social well-being attitudes, high-importance individuals tended to be more satisfied than low-importance ones (average point difference). In particular, for social well-being, high-importance subjects were more satisfied with all perceived quality items, except ticket price and punctuality, which were evaluated similarly by low- and high-importance individuals. As for the environmental variables, frequency, staff, comfort, and intermodality were appreciated more by high-importance respondents.

Tab. 5: Summary statistics of sustainability attitudes (10-point scale)

Characteristic	Mean	SD	Mode	Mode %
Global warming concern	8.12	1.88	10	31.58
Environmental impact	7.73	2.01	8	26.08
Social well-being impact	7.61	2.03	8	25.84

Source: our elaboration

4.1.3.2 Sustainability attitudes and modal choice

In this section, we investigate the sustainability attitudes of the respondents according to user type (Table 6). Frequent and sporadic users seemed to be more concerned than non-users about sustainability. First, non-users assigned less importance to the environmental impact of their selected transfer mode than did frequent and sporadic users (mean values were 6.61, 7.62, and 7.90, respectively). The differences between non-users and frequent users and between non-users and sporadic users were both found to be significant ($p < 0.01$ and $p < 0.001$, respectively, Mann-Whitney U test). Non-users assigned less importance to the social well-being variable (mean = 6.77 for non-users; 7.52 for frequent users; and 7.72 for sporadic users), and the comparisons between frequent and sporadic users were significant ($p < 0.05$ and $p < 0.01$, respectively). The coherence of these results provides evidence that frequent users tend to be significantly more concerned about the impact of their choice of transport mode than non-users but less concerned than sporadic users. However, non-users did not significantly differ from the other two types of respondents in terms of concern for global warming, where the difference between frequent and sporadic users was only significant at $p < 0.05$. Because global warming is particularly challenging and less controllable, the impact of individual behaviour may be regarded as slightly incisive. In line with this view, people may decrease their involvement in global warming because they do not feel that their choices can make a difference. This may have reduced the difference between non-users and the other two types of respondents.

Tab. 6: Sustainability attitudes by type of user

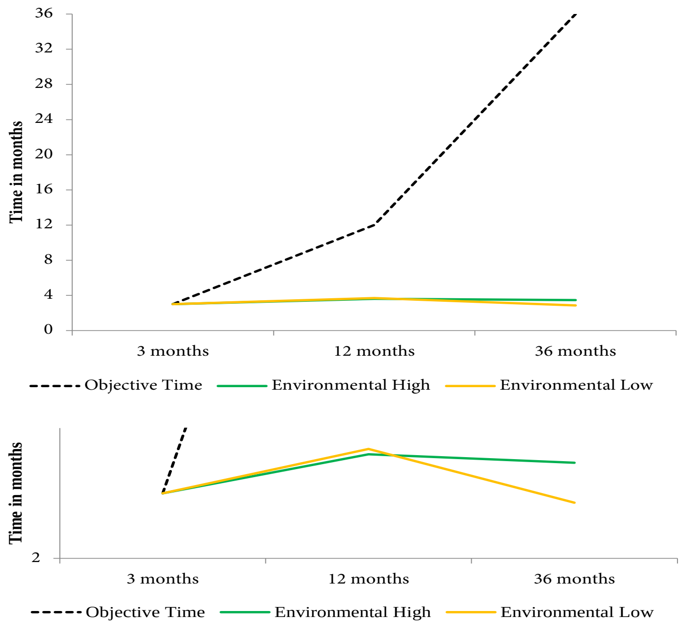
Characteristic	Mean	SD
Global warming:		
Frequent user	7.95	1.96
Sporadic user	8.36	1.77
Non-user	7.89	2.19
Environmental impact:		
Frequent user	7.62	2.07
Sporadic user	7.90	1.88
Non-user	6.61	2.75
Social well-being impact:		
Frequent user	7.52	2.07
Sporadic user	7.72	1.97
Non-user	6.77	2.68

Source: our elaboration

4.1.3.3 Environmental attitude and time perception

Fig. 4 (top panel) displays the results obtained for the estimates of the duration between today and the future, as given by the respondents according to their low or high level of importance. As noted earlier, participants were considered high- or low-importance individuals based on their responses regarding the importance of the environmental impact of their selected transfer mode. Compared to the objective time (i.e. 3, 12, and 36 months; dashed line), the subjective times appear to be less sensitive to change. As shown in the bottom panel of Fig. 4, this is particularly true for high-importance participants. More specifically, for this group of respondents, compared with low-important ones, subjective time was lower at 12 months (not significant - Mann-Whitney U test) but also particularly higher at 36 months ($p < 0.05$). For low-importance individuals, subjective time tended to decrease over time (between one and three years, $p < 0.05$; not significant for the high-importance group). These findings are closely tied to the tendency of some individuals to assign greater weight to rewards that are closer in time (i.e., present bias; O'Donoghue & Rabin, 1999). This present-biased attitude may prevent low environmentally concerned individuals (or at least some of them) from providing a correct cost-benefit analysis of consumption in general and LPT use. In other words, present bias may lead to an underestimation of the benefits of LPT and an overestimation of its costs, with potential negative consequences for the perception of the service and the overall demand for public transport.

Fig. 4: Environmental attitude and time perception
(top panel; close-up on the bottom panel)



Source: our elaboration

4.2 Semi-structured interviews with LPT operators[2]

The main aim of the interviews was to identify the reasons and motivations for the modal shift towards LPT. To this end, the interviewees emphasised various strategies that could be categorised into several broad areas including conventional and innovative approaches. The strategies appear heterogeneous for some characteristics, such as the type of users (e.g. systematic, sporadic, business) or the environment (i.e. urban and suburban). As an LPT expert clarified:

This is not a recipe, there are many elements that contribute to increasing the attractiveness of public transport.

Innovative strategies include technology and digitalisation processes such as electronic ticketing and credit card validation. In the pay-per-use payment context, a single ticket is less convenient for users. By facilitating free movement within the LPT network, all subscriptions should encourage users to increase their use of public transport, particularly in urban environments. Strategies along this line should consider the release of transportation bonuses and the possibility of monthly subscriptions in pay checks for using LPT. This may reduce LPT costs through integrated welfare policies.

Real-time information is considered as a strategy for increasing public transport use, especially among occasional users. Information will be increasingly digitised in real-time through maps, social channels, and apps. This guarantees maximum accessibility and timeliness within an inclusive mobility framework. Note that the information also comes from traffic models and the simulation of mobility demand, particularly in terms of frequency, availability, and travel distance. These models can provide timely information on the reasons and types of movement of LPT users and non-users and are crucial in building adequate offerings based on mobility, including logistic mobility, in the area. Considering the heterogeneity of user mobility, creating a range of offerings based on the type of LPT recipient is essential. For example, senior citizens tend to make local trips and prefer buses as a means of transport, while business users usually have a greater need for fast and more frequent means of transportation such as subways. Data-driven offers can adapt to the continuous evolution that characterises requests for LPT. Additionally, information plays a crucial role in both urban and suburban contexts, where waiting for public transport without timely information can lead to frustration and general dissatisfaction with LPT services. The lack of adequate information and fragmented access to services are frequently cited as primary obstacles to engaging in LPT.

Another strategy is characterised by intermodal and mobility sharing, including urban and suburban services, which shares multiple services using an integrated ticket. Intermodal and mobility sharing, such as carpooling services or community car-sharing, tends to decline according to the urban configuration, population density, and geographical location

[2] All interview citations are provided in italics and translated from Italian.

of the reference area, particularly in suburban areas where accessibility is reduced. Intermodal services reduce the need for parking in areas with a high-traffic concentration. Intermodal and mobility sharing are increasingly prevalent in urban contexts, where services such as bike-sharing, free-floating, and electric charging points simplify mobility. This integrated offering encourages the use of multiple modes of transport and peaks in mobility as a service business model: a flexible and territorially distributed LPT offering which integrates public and private modes of transportation. Integrated services appear crucial, particularly for first- and last-mile coverage, which typically represent a weakness of LPT.

Another classical strategy is to increase the quality of LPT services. The interviewees mainly referred to capillarity and frequency as well as accessibility (networks, infrastructure, better comfort at stops), service punctuality and regularity, cleanliness and comfort, crowding, and safety (particularly for night lines). For metro stations, running auxiliary systems such as lift and stairlift services is also important. Effective and efficient LPT is essential for modal shifts. Some interviewees emphasised that there has been a change in the perception of crowding since the pandemic. For instance, an LPT expert remarked:

On the parameters linked to crowding, which is not the same as in 2019, […] we do not remember much more what the crowding levels were in 2019, compared to what we find now, and perhaps we are more inclined to consider, for example, a subway train carriage or a bus very full when we are at 75-80% and in 2019 we considered it to be at the same level of crowding when it was at 90%.

Therefore, quality assessment depends on perceived quality rather than on objective indicators. Although an indicator such as cleanliness is more difficult to evaluate objectively, quantitative assessments exist for others, such as crowding. However, users may have different perceptions of these indicators. Another critical issue that needs to be addressed promptly pertains to staff and their interactions with customers, driver guidance, and recruitment. In recent years, the competitiveness of pay has diminished, requirements for substantial hourly commitments (e.g. night shifts) have intensified, and concerns regarding driver safety owing to potential aggression from users during interactions have emerged. The approaches implemented for improving the quality of service can be different (alignment of timetables and general reprogramming of the service). However, given the lack of additional resources, an increase in service as an action to expand it is not feasible.

Other strategies that have been reported to be helpful for model transfer are the following: educational campaigns (e.g. European Mobility Week), promotion of sustainability (a cleaner system in terms of emissions may lead to an increase in the use of LPT, especially considering the growing awareness of environmental issues), urban planning (securing the areas around schools, home-work travel plans, general improvement of the perception of quality space), and reduction of alternatives to LPT. LPT is made more competitive by limiting the number of parking spaces in central and high-traffic areas, and increasing parking rates. Regarding private transport, according to the president of an LPT association:

If I can't get to a place with my private car, or it becomes hyper-expensive, I can choose the [public] transport and I have to be tied to that.

Also, an LPT executive (public administrations, municipal level) emphasised that:

It would be better not to own a car because owning a car is a hidden cost that the citizen doesn't perceive (tyre changes, mechanic, all the maintenance that you never take into account).

As for sustainability policies, the executive of a LPT company referred to the building of a

great workplace, a workplace where all people have these values, these principles, and promote the principles of sustainability.

In contrast, the reduction in service offerings and increase in local transport fares generally reduce user satisfaction and the demand for LPT disproportionately.

The interviews also showed that peak hours currently have a different impact on LPT services than they have in the past. First, a general decrease in demand exists due to the different ways of working (i.e. remote working), but particularly because of the substantial increase in the use of mobility which is not systematic (i.e. different than home-work travel plans). This can be considered a "regeneration" of lifestyle habits rather than dissatisfaction with LPT. Furthermore, peak hours now occur in conjunction with events (exhibitions, concerts, etc.) which are neither stable nor distributed over time.

5. Discussion

Sustainable well-being is a complex and multidimensional construct that has recently been integrated into various components. In this new framework, well-being is not limited to economic needs, but is widening to environmental, social, and relational needs. In particular, despite well-being typically being human-centred, considering recent phenomena such as global warming and climate change, it is now more crucial than ever to promote well-being in a sustainable manner. Given that the recovery timeframe has shortened, the long-term environmental and social impacts of individuals' decisions in the present and future must be considered.

This study contributes to this theme by focusing on the modal choices in urban and interurban mobility. This is an area of consumer decision-making that has a significant potential impact on sustainable well-being from various perspectives, including environmental impacts, health, quality of life, social equity, and the interconnectedness between natural and social systems. More specifically, this study investigates the motivations and strategies that may favour a modal shift from private cars to LPT, emphasising the role of perceived quality and individual sustainability attitudes. Compared with previous research, our study incorporates multiple dimensions: service quality, sustainability attitudes, and time preferences. It also integrates the perspectives from different types of consumers and LPT managers. To this end, both an online survey and semi-structured interviews were designed to complement users' and non-users' opinions from the perspective of LPT operators.

Regarding perceived quality, semi-structured interviews with LPT operators highlighted the importance of users' perceptions more than that of objective indicators in the assessment of service quality. The quality items most reported during the interviews corroborated those found by participants in the online survey to be most significant, particularly frequency and punctuality. Overall, our findings suggest that the most decisive intervention for improving the attractiveness of LPT is to improve frequency attributes. As this requires significant structural investments, managers instead stressed the role of information, technology, digitalisation, and intermodal mobility.

Sustainability was also recurrent in both the survey data and qualitative interviews. Experts identified the promotion of sustainability as a strategy for modal shifts. In line with this, in the online survey, we found that the importance assigned to the environmental impact of the selected transfer mode positively influenced the overall LPT perceived service quality as frequent users were more concerned about the environmental and social well-being impacts of their transfer mode. Individuals who were less concerned about the environmental impact of their transfer mode showed subjective time perception consistent with that of a present-biased attitude. This implies a difficulty in delaying gratification in favour of immediate satisfaction and can affect a variety of decision-making situations, including the environmental and sustainability areas.

6. Conclusions

6.1 Theoretical implications

This study contributes to the literature on sustainable well-being, particularly by integrating sustainability into well-being (O'Mahony, 2022). According to our survey, in the context of LPT, we found significant support for the idea that perceptions of service quality differ between high and low sustainability attitudes (Borhan *et al.*, 2014). The study found that differences in these attitudes are present when comparing LPT users with non-users and that environmental attitudes differ according to time preferences.

Moreover, this study provides insights into the factors influencing modal choice, particularly the shift towards more sustainable transport modes. Our findings are consistent with previous results showing that personal transport can be modified through appropriate strategies (Avineri and

Goodwin, 2010; Lehner *et al.*, 2016; Metcalfe and Dolan, 2012; Tørnblad *et al.*, 2014). Lehner *et al.* (2016) discussed strategies aimed at supporting modal shifts, such as information dissemination and marketing, alongside behavioural approaches (Mattauch *et al.*, 2016; Steg and Vlek, 1997).

Finally, our insights can enrich the intertemporal decision theory in modal choice by providing hypotheses for testing transport shifts over time. The role of intertemporal preference in modal choice is typically classified as a self-control issue which can arise in a cost-benefit analysis when considering alternative modes (Malmendier and Della Vigna, 2006; Mattauch *et al.*, 2016). Acquiring travel information has a short-term cost that returns benefits in the long run. This may prevent the prioritisation of long-term goals such as environmental safety and social well-being.

6.2 Practical implications

Our findings suggest that managers can take action to promote modal shifts. These actions may include promoting active transportation, enhancing the quality and infrastructure of public transport, considering the heterogeneity of transport users, and reducing public transport alternatives by encouraging collaboration among LPT stakeholders. Implementing these actions can contribute to sustainable mobility and enhance the long-term well-being of both the environment and society.

The finding that individuals with stronger environmental and social attitudes tend to report higher satisfaction with quality items has crucial managerial implications. Managers should consider these insights when designing communication strategies to ensure that messages are coherent across channels. However, managers can implement campaigns targeted at specific user groups, highlighting the environmental and social benefits of using LPT. Providing ongoing feedback on the sustainability status of LPT and how individuals can contribute to creating a more sustainable and liveable community can also be effective.

Regarding transport modes, education and training programs can empower individuals to use public transport effectively and confidently and incorporate subjective feedback into service enhancements and communication strategies. Drawing from behavioural studies, mobility managers can design, test, and implement interventions aimed at directing individuals towards more sustainable transport choices. This approach may involve choice architecture, social norms, and other tools to encourage behavioural change. Therefore, managers should acknowledge the diversity in attitudes and personal characteristics among those targeted for modal shifts and tailor information to provide timely and individualised insights into the benefits of choosing LPT. This can facilitate a long-term modal shift and contribute to the establishment of a "great workplace", where as stated by one of the experts, "all people promote the principles of sustainability", aligning with the concept of sustainable well-being.

Our findings suggest that sustainable transport can be promoted directly by managers through service quality improvements by effective communication aimed at improving consumer perceptions and indirectly through interventions targeting attitudes and perceptions of time. Consequently, an integrated approach that combines various managerial policies and promotes sustainable approaches and long-term planning can have a synergistic effect on modal shifts. At the same time, the results also showed that a modal shift can be particularly challenging for non-users. According to experts, managers of LPT companies must rely on the support of local policymakers to make LPT more competitive by, for instance, limiting parking space and increasing parking rates and, more generally, removing convenience for private transport. Equally important, some interviewees emphasised that managers should work to overcome the classic concepts of car use and ownership. To this end, everything that makes car ownership less necessary, particularly promoting clean mobility and efficient means of transport, intermodality, and mobility sharing, can provide a strong boost for the use of LPT. In the near future, holders of LPT service contracts will increasingly be required to provide appropriate offerings providing intermodal and mobility sharing and to satisfy the sustainability criteria in tender specifications for the procurement of goods, work, and services. Additionally, managers must simplify accessibility to LPT. This should be realised in conjunction with policymakers, associations, and all key stakeholders (e.g. mobility managers), considering that, as emphasised by the interviewees, these strategies are deeply related to urban planning and city management which require time-consuming regulatory changes and must be consistent with municipal policies, plans, provincial regulations, and concerted efforts at different levels.

6.3 Limitations and future research

Future research should assess the extent to which individuals' time preferences apply to modal shifts by estimating subjective discount rates (Faralla *et al.*, 2017; Kirby *et al.*, 1999). In this study, we used time preference which reflects an individual's attitudes towards receiving a payoff sooner rather than later. Discount rates represent a personal assessment of the value of future outcomes and can be used to model decisions in different areas, including transportation, using a more systematic approach.

Another limitation of the present study relates to the use of a self-selected sample for the online survey which can have potential limitations, including self-selection bias and overall reduced generalisability. For instance, a self-selected sample may overrepresent individuals with strong attitudes towards sustainability. Before participating in the survey, the participants were unaware of the contents of the study. We indicated that they would participate in a survey on LPT. Moreover, we ensured that diverse subgroups were represented in the sample (students, administrative staff, and professors) which likely had different commuting habits owing to differences in schedules and responsibilities. This type of sampling may capture these variations and increase generalisability when developing policies or marketing strategies. The results were consistent with both the literature and the qualitative data, suggesting that the findings may be representative of a broader population.

We used a revealed-preference approach in the online survey. While the direct approach used in this study effectively elicited individuals' actual behaviour, future research could enhance our understanding of hypothetical scenarios related to LPT by combining it with a stated preference technique, possibly a discrete choice experiment that directly discriminates between the use of public and private modes. This approach can provide valuable insights, particularly from the perspective of non-users.

Overall, modal shift appears to be multidimensional and context-dependent. As we have seen, the choice of transport mode can be strongly influenced by habit formation in consumption preferences and cognitive biases, which may lead to the over or underestimation of LPT characteristics. These biases may have negative consequences on perceptions of service quality and demand for public transport. In these cases, the strategies presented are extremely useful, but may nevertheless prove to be insufficient in promoting a modal shift towards public transport for some specific groups of users. Future studies should investigate the heterogeneity of responses to modal shifts towards public transport by employing behavioural approaches (Thaler and Sunstein, 2008) and conducting field experimentation (John, 2017) to develop tailored strategies.

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Autonomous vehicles, perceived risk, and carsharing compatibility: assessing behavioral intention in Italy[1]

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Abstract

Frame of the research. *Developed to predict an individual inclination toward a certain type of technology, over the years, a Technology Acceptance Model (TAM) has been enriched with additional context-specific variables to adopt the model to new technologies, as well as integrating with Innovation Diffusion Theory (IDT). This paper relies on both of these to tackle the complex phenomenon of the mass diffusion of Autonomous Vehicles (AVs) and to analyze individual behavioral intention toward AVs.*

Purpose of the paper. *To our knowledge, few studies have focused on the perceived safety risk associated with AVs, despite the importance of this variable in potentially hindering or hampering the adoption of the technology. In addition, previous research shows that AV technologies could fit well into a carsharing business model, leading to what some authors call a fleet-oriented market. The paper analyzes these aspects as antecedents of the intention to adopt AVs in the future.*

Methodology*. Drawing from an integration of the Technology Acceptance Model with Innovation Diffusion Theory, the proposed research model analyses the effects of Perceived Usefulness, Perceived Ease of Use, Subjective Norm, and Perceived Safety Risk on the intention to use AVs, whilst considering carsharing compatibility as a moderator of the relationships between Perceived Usefulness, Perceived Ease of Use, and Perceived Safety Risk over behavioral intention. A survey on an Italian sample is conducted and data analyzed using SEM.*

Results*. Results, measured over a sample of 361 respondents, suggest that high carsharing compatibility decreases the importance of the Perceived Ease of Use variable for the intention to use AVs, while leading to a deeper consideration of the Perceived Usefulness variable over intention. Overall, carsharing compatibility does matter in fostering the behavioral intention to use AVs in the future.*

Research limitations. *The high technical complexity of Autonomous Vehicles and the fact that they are not fully available make it difficult for respondents to understand, for example, the different levels of automation involved and the implications these technologies could have on daily life. In addition, the study has some limitations that could be addressed in future research initiatives.*

Managerial implications. *This study analyses the intention to use AVs by considering carsharing compatibility within a TAM model: it sheds light on how integrating innovation in the mobility sector could foster the most radical innovations to be accepted. Ultimately, managerial implications deal with the sustainability of*

local transportation systems that can be redesigned in light of the synergies between different technological innovations.

Originality of the paper. *Overall, the paper enriches the current debate on the intention to use AVs by offering an integration of TAM with IDT by focusing on the role of carsharing compatibility. In addition, it is based on an Italian sample that, to our knowledge, had not yet been investigated.*

Key words: *autonomous vehicle, technology acceptance model, carsharing, intention to use.*

1. Introduction

Among the issues which stand in the way of the mass diffusion of Autonomous Vehicles (AVs) and which limit them to experiments or protected labs, literature argues that user acceptance is more detrimental than technical barriers (Xiao and Goulias, 2022). An increasing number of empirical studies (e.g., Choi and Ji, 2015; Koul and Eydgahi, 2018; Nastjuk *et al.*, 2020; Xiao and Goulias, 2022) has focused on individual characteristics, personality traits, and subjective perception as factors influencing the intention to use AVs, thereby impacting their diffusion in local transportation systems. With regard to demographic characteristics, such as age, income, and education, results suggest that young people with a higher income are more likely to accept AVs (Bansal and Kockelman, 2017; Koul and Eydgahi, 2018). Similarly, Xiao and Goulias (2022) recognize young, well-educated males as the segment with the highest disposition to use AVs. Studies have also investigated how personality traits, such as a desire to exert control or the external locus of control, influence the intention to use AVs (Nastjuk *et al.*, 2020; Choi and Ji, 2015). Regarding the personal perception of AVs, literature refers to those theories and models developed to understand how technology use is diffused, finding contrasting results (Hamburger *et al.*, 2022). However, the antecedents of user intention related to a striking innovation such as AVs require further study.

In this paper, we rely on both Technology Acceptance Model (TAM) (Davis, 1989) and Innovation Diffusion Theory (IDT) (Rogers, 1995) to deal with the complexity related to user behavioral intention regarding AVs - in line with previous empirical studies in technological contexts (Zhang *et al.*, 2008; Giovanis *et al.*, 2012). TAM is one of the most widely used models to investigate the intention to adopt new technologies. Originally applied to information systems, it was lately extended to other technological fields to examine the individual technology acceptance behavior and enriched with specific context variables to investigate the phenomenon deeper. To assess variables of interest from TAM models, we deal with the current understanding of the phenomenon. As Fagnant and Kockelman (2018) point out, the task of driving is strictly related to a perception of safety, stating it as one of the crucial variables. While using AVs, people have to entrust safety to the automated system, raising the bar for automated driving safety above that of traditional driving (Fagnant and Kockelman, 2018; Xu *et al.*, 2018). In addition, some studies have consistently reported perceived risk as one of the most frequently mentioned reasons for not accepting AVs (Man *et al.*, 2020; Choi and Ji, 2015; Lee *et al.*, 2019). Only a few empirical studies, to date, have focused on the perceived safety risk related to AVs (Man *et al.*, 2020), analyzing perceived safety risk mainly as a predictor of trust rather than of the intention to use AVs (e.g., Man *et al.*, 2020; Zhang *et al.*, 2019).

As for IDT, we focus on compatibility as the extent to which innovation fits the needs, values, and experiences of the consumer (Rogers, 1995). Compatibility is related to an external condition in the adoption environment (Zhang *et al.*, 2008) and may indicate behavior toward other phenomena related to the technology under consideration and that has already experienced some degree of diffusion. In this case, compatibility towards existing technologies may play a crucial role in affecting the intention to use a new technology (Min *et al.*, 2019). However, it is difficult to determine compatibility for technologies that are either not widely used or not yet commercially accessible, such as a higher level of AVs. We then consider carsharing compatibility. Previous research has indeed found that AV technologies fit well into a carsharing business model, leading to what some authors call a "fleet-oriented market" (Wachenfeld *et al.*, 2016; Teece, 2018). Furthermore, a carsharing experience is a suitable means of innovation adoption in urban mobility (Han *et al.*, 2019; Schlüter and Weyer, 2019), so that interest in automotive innovation may result from a mobility-related receptiveness in people who have used or use carsharing. We then assume that people whose mobility style fits well with carsharing services may perceive fewer risks and a lower required effort associated with the use of AVs, and they could see in the characteristics of the technology a means to overcome some issues related to carsharing services.

An online survey was conducted on an Italian sample of 361 individuals. Results show the antecedents of the intention to use AVs, with perceived usefulness and perceived ease of use as the most influential, whilst the perceived safety risk has a negative impact. In addition, a high carsharing compatibility positively moderates the intention to use AVs. Overall, the contribution of the paper is threefold. Firstly, it enriches the current debate about the TAM with an analysis of the factors influencing the intention to use AVs. Secondly, the context-specific variable, perceived safety risk, is added to the model, as the extent to which a person believes the safety of AVs could meet expectations. Thirdly, a further attempt to improve the debate around acceptance models has been offered by the integration of TAM with IDT, by looking specifically at the role of carsharing compatibility.

The paper is structured as follows. The next paragraph presents the theoretical framework. The third paragraph presents the research model and the hypothesis. The fourth paragraph presents the methodology, and the fifth the results. The sixth paragraph discusses the findings, whilst the conclusions, limitations and future avenues of research end the paper.

2. Literature review

When people deal with new technologies, attitude is a crucial point in the acceptance process (Davis, 1989). Among the models that have been theorized to predict an individual inclination toward a certain type of technology, a Technology Acceptance Model (TAM) is one of the most used. Based on the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975), performance or non-performance of a given behavior is primarily determined by the strength of *a person's* intention to perform (or not perform) that behavior (Fishbein and Ajzen, 1975). In TAM, Davis (1989) recognizes Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) as the drivers for the attitude toward a certain technology. The attitude predicts the intention to use that technology, or behavioral intention (BI), defined as *a person's* subjective probability of performing certain behavior. While PU tackles the performance enhanced by the prospect of using a new technology, PEOU refers to how easy and free from effort the use of a new technology is (Davis, 1989). Integrating new variables and resulting in TAM2, Venkatesh and Davis (2000) proposed Social Norms (SN) and add two more variables related to the social influence processes, namely Image, *meaning* the *aspiration* to maintain a favorable position among others, and Voluntariness, as the extent to which an individual decides freely to use a specific technology. More specifically, SN has been used to study technologies applied to contexts other than those adopted in the workplace. In parallel, TAM3 (Venkatesh and Bala, 2008) integrates additional determinants which positively influence PEOU: self-efficacy, perception of external control, computer anxiety, computer playfulness, perceived enjoyment and objective usability.

To assess which TAM variables are the most suitable in the context of AVs, we proceeded with a review of the empirical studies on the topic. Without the ambition of a systematic review, a total of 33 papers, starting from 2011, were selected, and the employed variables used were analyzed. Most research (e.g., Ghazizadeh *et al.*, 2012; Park *et al.*, 2015; Koul *et al.*, 2018) shows that a high level of PEOU and PU influences the intention to use AVs favorably (Koul and Eydgahi, 2018; Panagiotopoulos and Dimitrakopouluos, 2018; Rahman *et al.*, 2017), in line with what was found for previous technologies. However, the results are still not completely homogeneous. Some authors have found that PU does not have a favorable influence on BI, but just on attitude (Man *et al.*, 2020), whereas PEOU has no significant effect on attitude or BI (Man *et al.*, 2020; Lee *et al.*, 2019). In addition, SN, as the extent to which a person perceives that others (e.g., family, friends, colleagues) believe they should use AVs, is considered to have a positive impact on the intention to use them (Zhu *et al.*, 2020; Panagiotopoulos and Dimitrakopoulos, 2018; Rahman *et al.*, 2017). However, a lack of internal consistency within the SN construct has been noted, leading to a different consideration by respondents according to the source of social pressure, whether influencers (e.g., idols, celebrities) or people who are important to them (e.g., family members) (Rahaman *et al.*, 2017). Studies on AVs show a positive influence of self-efficacy on the intention to use (Buckley *et al.*, 2018; Choi and Ji, 2015; Lee *et al.*, 2019).

Specifically, Lee *et al.* (2019) found that only self-efficacy, and not PEOU, has a significant effect on the intention to use AVs, due to the fact that the ability to drive could be critical in AVs too (Lee *et al.*, 2019). Overall, one of the main advantages of the TAM is its flexibility to add variables according to the technological context (Ghazizadeh *et al.*, 2012). Hence, many researchers have used the TAM framework as the base model, to which adding new constructs and to offer a deeper explanation of technology acceptance.

As Fagnant and Kockelman (2018) point out, the driving task is strictly related to a safety perception and it is one of the crucial points in determining the individual behavioral intention to use AVs. While using AVs, people have to entrust their safety to the automated system, raising the bar for automated driving safety above that of traditional driving (Fagnant and Kockelman, 2018; Xu *et al.*, 2018). Previous studies also integrate the perceived risk with the TAM model (Zhang *et al.*, 2019; Lee *et al.*, 2019; Man *et al.*, 2020). Lee *et al.* (2019) enrich the TAM theory with the perceived risk variable, looking at its influence on the intention to use AVs and analyzing self-efficacy and PEOU as antecedents of perceived risk. Similarly, other studies also demonstrate that performance risk negatively influences the intention to use, while not being influenced by any variable, due to the fact that any accidental situations which might arise whilst driving an AV are perceived as related to external factors, since users are involved in few tasks (Lee *et al.*, 2019). Man *et al.* (2020) consider two types of risk when it comes to AVs: privacy risk and safety risk, both of which have some effect on PU. Concerning safety-critical activities, when using AVs people must entrust their safety to the automated system. In addition, a privacy risk emerges, which may result from the possibility that behavioral data or travel data might be obtained by third parties without the consent of users (Man *et al.*, 2020). The same types of risk are analyzed by Zhang *et al.* (2019) as antecedents of initial trust, pointing out that, while the safety risk has a significant negative effect on initial trust, no significant influence can be attributed to the perceived privacy risk. As for the TAM variables that ultimately appear as most suitable and adapted to an in-depth study within the context of AVs, perceived usefulness and perceived ease of use are considered as the strongest predictors of the intention to use, as well as the subjective norm, as the social influence acquires a relevant role for those technologies not yet fully widespread. In addition, the technological context that is still at a too embryonic stage would not allow the integration of other work-related variables, or any conceptual nuances between self-efficacy and perceived ease of use, and constructs such as playfulness and enjoyment would require a certain degree of experience to be evaluated more effectively. The perceived risk is, then, an important element characterizing the specific technological context.

Some authors (e.g., Yuen *et al.*, 2020, 2021) also integrate the TAM with variables related to Rogers's (1995) IDT while studying AVs. At the core of IDT there are five main constructs influencing adoption: relative advantage, compatibility, complexity, trialability, and observability. Relative advantage reflects the extent to which an innovation is perceived to be better than another for the same purpose (Rogers, 1995). Related to AVs, the construct reflects the advantages of compared to traditional vehicles (Lee *et al.*, 2019) and it has been analyzed both in relation to the other IDT variables (Yuen *et al.*, 2020, 2021) showing a positive influence on PU (Yuen *et al.*, 2020, 2021; Lee *et al.*, 2019). Compatibility is the extent to which the innovation is compatible with the needs, values, and experiences of the consumer (Rogers, 1995). Complexity shows the degree of difficulty in understanding and using the innovation (Rogers, 1995). Trialability defines the degree to which an innovation can be tested before actual adoption, while observability refers to the tangibility of the results obtained by using the new product (Rogers, 1995). In order to integrate the TAM and the IDT, Yuen et al (2020, 2021) analyze the IDT variables as antecedents of PU and PEOU, arguing that TAM and IDT are complementary models that can be integrated to explain the intention (BI) to use AVs. However, we believe that applying the IDT variables to technologies that are only present at an experimental level, can lead to biased findings. In fact, because full AVs are not yet available on the market, it is hard to consider IDT, based on the actual use of the new product, as a model by which to measure acceptance (Yuen *et al.*, 2021). Rather, in the case of emerging technologies that are not yet usable, like AVs, we argue that IDT variables could only be fruitfully used to capture user attitude towards technologies actually in use and to determine whether they might influence the future adoption of an emerging technology (Zhang *et al.*, 2008). For this reason, we focus on compatibility, and in particular on carsharing compatibility: previous studies have, in fact, shown that carsharing can positively influence the acceptance of more radical innovations such as electric and autonomous vehicles (Han *et al.*, 2019).

3. Research Model and Hypothesis Development

The following variables have been considered in the research model: Perceived Usefulness (PU) (TAM), Perceived Ease of Use (PEOU) (TAM), intention (BI) to use AVs (TAM), subjective norm (SD) (TAM 2), perceived safety risk (PR), and carsharing compatibility (IDT). Considering the still highly experimental nature of AVs and, consequently, the lack of consumer experience, the intention (BI) to use AVs has been selected as a dependent variable. BI is defined as a person's subjective probability of adopting certain behavior and is taken as the strongest predictor for guiding actual system use (Davis, 1989). We argue that a thorough analysis of the intention to use AVs could represent a robust antecedent of effective future adoption behavior. The main hypotheses are then presented.

3.1 Perceived Usefulness and Perceived Ease of Use

Within the TAM framework, PU and PEOU are considered the most important predictors of BI (Davis, 1989). In the context of AVs, PU defines the utility related to the AV use, while PEOU refers to the degree to which a person believes using an AV will be free from any significant effort. Within the literature regarding the intention to use AVs, both variables have been analyzed frequently (e.g., Rahman *et al.*, 2017; Koul and Eydgahi, 2018), and the intention to use AVs mainly depends on how easy and useful AVs are perceived (e.g., Zhang *et al.*, 2019; Nastjuk, *et al.* 2020; Panagiotopoulos and Dimitrakopoulos, 2018).

The intention to use AVs may be affected by the extent to which people believe AVs will help them in performing their task more efficiently (such as: reducing the time spent in the car, allowing them to perform other tasks while moving from one place to another). Since effort is considered as a limited resource that people could allocate to various activities (Radner and Rothschild, 1975), if an AV is perceived as easier to use, compared to a traditional vehicle, users are more likely to adopt it, as it reduces the mental and physical effort required for commuting, which can then be allocated to other activities. Likewise, if the vehicle is too difficult to use, the performance benefits of usage could be overshadowed by the effort of using it. We then expect that, also for AVs, PEOU will reinforce PU. The following hypotheses are posed:

H1. Perceived usefulness (PU) positively affects the intention (BI) to use AVs
H2. Perceived ease of use (PEOU) positively affects the intention (BI) to use AVs
H3. Perceived ease of use (PEOU) positively affects the perceived usefulness (PU) of AVs

3.2 Subjective Norm

Subjective norm (SN) reflects "perceptions that significant referents desire the individual to perform or not perform a behavior" (Taylor and Todd, 1975, p.149), meaning that the judgement of individuals toward a certain technology tends to follow what people who are important to them actually do or think. As a social factor, SN consists of the perceived opinions of other people or groups that are close or important to the individual, ultimately influencing individual decisions (Fishbein and Ajzen, 1975). Applied to AVs, SN is the extent to which individuals perceive that family, friends, or colleagues think they should use AVs. In the literature there is a consensus about the fact that the positive opinion of others about the usefulness of AVs can influence individual perception (e.g., Buckley *et al.*, 2018; Panagiotopoulos and Dimitrakopoulus, 2018). For instance, peer-to-peer pressure has been demonstrated to play an important role in the decision to adopt AVs (Zhu *et al.*, 2020). Bansal and Kockelman (2017) show that half the American population would be more likely to try AVs if they were adopted by family members, friends, or neighbors, showing that future AV adoption rates could depend on the adoption rates of a close set of intimate individuals. The following hypothesis is posed:

H4. Subjective norm (SN) positively affects the intention (BI) to use AVs.

3.3 Perceived Risk

Perceived risk (PR) refers to the perceived uncertainty in a given situation and the expectation to bear losses due to uncertainty (Bauer, 1967). To date, few studies have focused on the perceived safety risk associated with the intention (BI) to use AVs (Man *et al.*, 2020), while focusing on perceived safety risk as a predictor of trust (Zhang *et al.*, 2019) or PU (Man *et al.*, 2020). Associated with AVs, PR is the extent to which a person believes that the AV will not behave as expected, reducing their intention to use it. Although a large number of studies demonstrate a decrease in the number of incidents thanks to AVs and the subsequent enhancement in traffic safety levels (Liu *et al.*, 2019), the perceived safety risk associated with AVs among potential users has still been found to be high (Schoettle and Sivak, 2014). The following hypothesis is posed:

H5. Perceived safety risk (PR) negatively affects the intention (BI) to use AVs

3.4 Carsharing compatibility

Carsharing is described as an alternative to car ownership (e.g., Baptista *et al.,* 2014; Peterson and Travis, 2019), as people do not use their own car but use hourly rental services (Han *et al.*, 2019). The paradigm of private ownership related to vehicles is, then, switching toward a Transportation as a Service (TaaS) business model, and consumers rent the usage of the vehicle as needed rather than owning vehicles themselves (Teece, 2018). Some studies estimate that, just in the United States, the development of sharing economies related to the automotive sector could lead to a decline in annual sales in the order of several million units of car (Clements and Kockelman, 2017). Scholars expect a strong overlap of carsharing services with AVs (e.g., Motamedi *et al.*, 2020; Paddeu *et al.*, 2020), due to the expected high initial price of an AV and the fact that a vehicle able to go from one place to another without human intervention fits into a sharing business model well (Wachenfeld *et al.*, 2016). As carsharing services are growing in popularity and are seen as being in synergy with AVs (Krueger *et al.*, 2016; Teece, 2018), the question is being raised of whether using an AV as a private or shared means of mobility might influence the intent to use one.

Carsharing compatibility defines, then, the degree to which a carsharing model fits with a person's lifestyle and values (Han *et al.*, 2019). Some studies demonstrate that those people with an experience of carsharing have higher PU and intention to use shared AVs (Xiao and Goulias, 2022). Similarly, people with a high carsharing compatibility could see AVs as a potential solution to some problems related with carsharing services, such as spatial allocation and availability, leading to a stronger positive effect of PU on the intention to use AVs. Ultimately, a carsharing experience is a suitable means of innovation adoption in urban mobility (Schlüter and Weyer, 2019), becoming the vehicle through which emerging automotive technologies, such as electrification or autonomous driving, can make their way. Introducing AV technology in a carsharing business model would provide on-demand mobility at a low price and facilitate multi-modality by providing last-mile travel solutions, while lowering the barriers associated with traditional carsharing services, such as inconveniences caused by

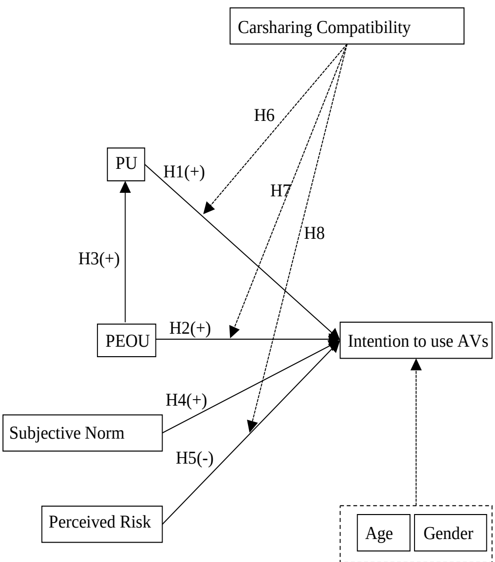
users travelling to access available vehicles and vehicle availability issues (Wachenfeld *et al.*, 2016; Paddeu *et al.*, 2020). The following hypothesis is posed:
H6. Carsharing compatibility increases the relationship between PU and the intention (BI) to use AVs

Rogers (1995) defines people with a high degree of innovation as those able to handle uncertainty and be more likely to take risks, assuming that they will have more enthusiastic intentions for using an innovation. In addition, they are more likely to be involved with the new technology and to handle the complexity of it easily (Rogers, 1995). At the same time, some studies define a positive relationship between innovativeness and carsharing services (Kim *et al.*, 2017; Han *et al.*, 2019), stating that individuals who have a high innovative propensity are more likely to have a positive opinion toward carsharing (Kim *et al.*, 2017). By analogy, people with a positive attitude toward carsharing services may see fewer risks associated with AVs and perceive them as less difficult to use. The following hypotheses are posed:

H7. Carsharing compatibility decreases the effect of PEOU on the intention (BI) to use AVs
H8. Carsharing compatibility decreases the relationship between Perceived Risk (PR) and the intention (BI) to use AVs

The research model is summarized in Figure 1.

Fig. 1: Research model



Source: authors' analysis

4. Methodology

4.1 Measurements

Measurements were taken from extant literature. Each construct was measured with multiple items and each item was borrowed from the literature to improve content validity. To measure PU, PEOU, and the intention to use, variable scale items from Davis (1989) were used. The scale items for SNs were adopted from Taylor and Todd (1995), while Featherman and Pavlou (2003) and Choi and Ji (2015) were used for the perceived risk (PR) scale. Finally, the carsharing compatibility items were adopted from Han *et al.* (2019). All items are based on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Appendix A shows the items used and sources from which they have been adopted.

Confirmatory Factor Analysis (CFA) was applied to analyze the measurement model, using Lisrel, considered among the most comprehensive packages (Iacobucci, 2009). Construct validity is achieved when fitness indices of the model meet the required levels. The model thus specified showed a reasonably good fit with the data: $\chi 2$ (degrees of freedom) = 361 (174), goodness of fit index (GFI) = 0.91; root mean square error of approximation (RMSEA) = 0.05; Standardized Root Mean Square Residual (SRMSR) = 0.04. All items tended significantly toward the hypothesized latent variables, indicating convergent validity. All constructs showed acceptable values of composite reliability (CR ≥ 0.897), average variance extracted (AVE ≥ 0.744) and Cronbach's alpha (CA ≥ 0.831).

To test for discriminant validity, for each construct we compared the square root of its AVE with its highest correlation with other constructs (Fornell and Larcker, 1981). The square root of a construct's AVE was always greater than its highest correlation with other constructs, indicating discriminant validity. Table 1 shows the results from the CFA.

Tab. 1: CFA results, convergent validity and internal consistency

		CA	AVE	CR	1	2	3	4	5	6
1	Intention to use	0.972	0.922	0.979	0.960					
2	PU	0.866	0.789	0.918	0.7	0.888				
3	PEOU	0.844	0.763	0.906	0.614	0.63	0.873			
4	Perceived Risk	0.831	0.744	0.897	-0.335	-0.19	-0.081	0.862		
5	Subjective norms	0.953	0.877	0.966	0.601	0.538	0.47	-0.16	0.936	
6	Carsharing compatibility	0.937	0.887	0.959	0.306	0.26	0.25	0.096	0.33	0.941

Source: Authors' analysis

4.2 Data collection and sample description

Data were collected through a questionnaire and an online survey. The first part of the questionnaire was used to collect a participant's demographic information, while in the second part they were asked to respond to 30 items on the seven constructs included in the model.

Data from 373 respondents were collected through the online survey.

However, as these technologies will not be available in the near future, we believe it is reasonable to concentrate on the majority of respondents in the younger age group as potential future actual users of AVs. In addition, respondents who did not have a driving license could not complete the questionnaire. We also eliminated respondents who had missing data. As a result, a total of 361 respondents were selected and their profiles are shown in Table 2. The majority of them were younger than 33 years old (60%) and the prevalence is male respondents (57%).

Tab. 2: Sample characteristics

Variable	Category	No.	%
Gender	Female	155	42.9%
	Male	206	57.1%
Age	Younger than 33	219	60%
	33 and older	142	40%
Education	Middle school	4	1.1%
	High school	101	28.0%
	Bachelor’s degree	115	31.9%
	Master’s degree	112	31.0%
	PhD/second level master’s degree	29	8.0%
Driving Experience	1-5 years	111	30.7%
	6-10 years	82	22.7%
	11-15 years	60	16.6%
	More than 15	108	29.9%
Family members	1 member	32	8.9%
	2 members	86	23.8%
	3 members	95	26.3%
	4 members	122	33.8%
	5 or more members	26	7.2%

Source: Authors’ analysis

5. Results and discussion

The partial least squares structural equation modelling (PLS-SEM) results are acquired through the software of SmartPLS4.0. The structural model is tested based on bootstrapping with 5,000 subsamples. Age and gender were used as control variables in the model. With the path coefficient and its corresponding t value, we can assess statistical conclusion validity by testing the null hypothesis for each path coefficient (Table 3). All path coefficients are significant with the exceptions of H8. Of the seven supported hypotheses, five of them were found to be significant at $p<0.01$, and the others to be significant at $p<0.05$ (H7) and $p<0.10$ (H6). Only H8 is not supported. Specifically, PU has a positive effect on the intention to use ($\beta=0.32$, $p< 0.001$), while PEOU has a positive effect on both BI ($\beta=0.25$, $p<0.001$) and PU ($\beta=0.62$, $p<0.001$). Subjective norms (SN) also have a positive effect on the intention to use ($\beta=0.24$, $p<0.001$).

Conversely, perceived risk has a negative effect on the intention to use (β=-0.22, p<0.001). Finally, carsharing compatibility positively influences the relationship between PU and the intention to use (β=0.09, p<0.1), while negatively influences the relationship between PEOU and the intention to use (β=-0.09, p<0.05).

Tab. 3: Path coefficients

Hypothesis	Path	β	T value	P values	Supported or not
H1	PU → BI	0.323	6.147	0.000	Supported
H2	PEOU → BI	0.246	9.089	0.000	Supported
H3	PEOU → PU	0.624	15.412	0.000	Supported
H4	SN → BI	0.237	5.006	0.000	Supported
H5	Perceived Risk → BI	-0.223	6.176	0.000	Supported
H6	Carsh.Comp x PU → BI	0.092	1.932	0.053	Supported
H7	Carsh.Comp x PEOU → BI	-0.092	2.110	0.035	Supported
H8	Carsh.Comp x Perceived Risk → BI	0.042	1.136	0.256	Not Supported

Source: Authors' analysis

The results show that all the hypotheses predicted by the TAM are confirmed. In particular, the results show that PU and PEOU affect the intention to use AVs. On one hand, respondents believe using AVs would be useful for allowing them to do other tasks while driving, increasing productivity and relieving the stress of driving. On the other hand, the perception about the effort that is needed to use AVs would not hinder the intention to use them. In parallel, the belief that AVs are easier to use would enhance performance, positively affecting the PU. The subjective norm also has a significant impact on the intention to use, confirming that the social influence does affect AV adoption. As for other, not experienced technologies, opinion leaders assume a strong effect in the formation of acceptance (Venkatesh and Davis, 2000). As for the perceived safety risk, it has a significant and negative effect on the intention to use. Driving is inextricably linked to a safety perception (Fagnant and Kockelman, 2018). In line with previous studies (Zhang *et al.*, 2019), our results show that people who perceive AVs as having a higher risk are less likely to show an actual intention to use them.

Our model depicts a future in which AVs are integrated in a carsharing business model (Teece, 2018). This is, in part, verified by our results, from which it emerges that carsharing compatibility positively moderates the relationship between PU and the intention to use, indicating that those whose lifestyle and values fit well with carsharing services perceive the utility associated with AVs as a higher significant determinant towards their intention to use. This is likely related to the potential of AVs to overcome some of the limitations that are present in current transportation systems based on carsharing. Conversely, a negative moderation of carsharing compatibility affects the relationship between PEOU and the intention to use, showing that people who have more faith in carsharing services perceive that the ease of use of an AV has a lower impact on their intention to use. This is probably linked to the fact that people with a higher propensity to innovativeness, such as those people who have a positive attitude toward carsharing (Kim *et al.*, 2017), are willing to accept a higher level of complexity. However, contrary to our model, carsharing compatibility does not have any effect on perceived safety risk. Assuming a positive association between innovativeness and carsharing services (Kim *et al.*, 2017; Han *et al.*, 2019), we would have expected carsharing compatibility to reduce the perceived risk, i.e., those already accustomed to new service models in the automotive sector would be less wary of new technologies like AVs. However, in using AVs, users may consider themselves to be only involved in a few aspects of driving, as the positive relationship between PEOU and the intention to use partially confirms. The perceived risk associated with AVs may be primarily linked to external causes, such as system failures or accidental events (Lee *et al.*, 2019; Man *et al.*, 2020). Accordingly, whether AVs fit into a carsharing or individual driving pattern may not influence the perceived risk, as the potential users of AVs are likely to feel themselves hardly responsible for any accidental situations that might occur.

Overall, the study contributes to the stream of literature on consumer acceptance, by shedding light on key variables in the case of a technological change, defined as radical and strongly influencing consumer habits, as AVs have the potential to be. More specifically, it reinforces the applicability of the TAM in the context of emerging technologies such as AVs, showing that user perception of the utility and ease of use of AVs are essential drivers for their adoption. The results confirm that both perceived usefulness (PU) and perceived ease of use (PEOU) significantly influence the intention to use AVs. In addition, the study addresses the importance of the perceived safety risk as a key factor affecting the intention to use AVs, not only as a predictor of trust. While individuals who are more comfortable with carsharing are more inclined to adopt AVs, their concerns over safety remain significant. This suggests that further efforts are needed to mitigate safety concerns and enhance user behavioral intent in using AV technologies.

Furthermore, the study also contributes to the stream of literature on technology cycle and acceptance models, returning a nuanced picture of the complexity of variables and contextual factors that may intersect and influence the last phases. The novel inclusion of carsharing compatibility also contributes to the literature by extending the TAM framework with insights from IDT, shedding light on the social and behavioral contexts that influence technology adoption. The results highlight the moderating role of carsharing compatibility, indicating that individuals whose mobility styles align with carsharing services are more likely to perceive AVs as useful, thus increasing their intention to adopt that technology. This result also highlights the tendency of major technological trajectories of change to intersect and reinforce each other, not only in technological development, such as the development in connectivity in relation to the feasibility of AVs, but also in acceptance and diffusion, which, in the case of AVs, may be reinforced through a new mode of commuting.

6. Conclusion

This paper the factors that affect the intention to use AVs. We built a model drawing on the TAM and IDT. The TAM (Davis, 1989) is one of the most used theories for investigating the acceptance of new technologies. Although the TAM is a consolidated and effective model, it places emphasis, on the end user and individual characteristics, while little focus is given to the context of use even though is a crucial element for the adoption of new technologies. To tackle it, we then integrate - from IDT theory (Rogers, 1995) - compatibility as a moderating variable. Compatibility has been identified as the sole variable in Rogers's model to have a component of innovation that is still absent the TAM. Its connection to the context of use is precisely what makes it appropriate for investigating how users' prior experiences with related technologies influence their intention to use a particular technology (Min *et al.*, 2018). We specifically consider carsharing compatibility (Han *et al.*, 2019). Although it has been considered in earlier studies as a predictor of PEOU and PU, its moderating effect had not yet been directly investigated.

The contribution is threefold. Firstly, by applying the TAM model to the emerging context of AVs, it demonstrates a positive and significant effect on PEOU, PU, and SN. Secondly, the still under-explored relationship between the perceived safety risk and the intention to use is demonstrated. Thirdly, the main contribution lies in the integration of IDT and the TAM, by analyzing carsharing compatibility as a moderator of the model: results show the positive effects on the relationships between PU, PEOU, and the intention to use.

Results also offer practical and managerial implications to foster the acceptance of AVs and their diffusion in local transportation systems. On one hand, communications to end users should be addressed in order to highlight the benefits related to AVs, including in terms of improving the sustainability of the local transportation system. In addition, the fact that users associate the hazards of operating an AV with circumstances beyond their control highlights the need to provide adequate information regarding the checks performed on the vehicle prior to its release. Moreover, considering the positive role of opinion leaders (subjective norms - intention to use relationship), special attention should be paid to them as a means to foster the mass adoption of AVs. On the other hand, a human-friendly and sample design could make the user more confident in trying an AV, enhancing the probability of adopting it, especially if it fits in with carsharing services. Carsharing business models are likely to play a critical role in the diffusion of AVs. Collaborations with policymakers, manufacturing companies, and local carsharing service operators could help in the experimentation with higher levels of automation and the subsequent adaptation of local infrastructure, making them more familiar to the end user. Ultimately, policymakers should provide the necessary infrastructure to allow shared AVs to travel on public roads so that AVs can be integrated into the local transportation system to make it more efficient and sustainable.

This study has some limitations that could be addressed in future research. Firstly, AVs rely on technologies which are not yet fully available. Moreover, the high technical complexity makes it difficult for the respondents to understand, for instance, the different levels of automation involved and the implications these technologies could have on daily life. Secondly, the study is set as exploratory and cross-sectional, while complex phenomenon would need to be investigated further in time and space. Thirdly, the study focuses on an Italian sample and comprises only younger generations. Future research might, then, consider analyzing actual usage within experimentation fields such as living labs, which are emerging as a valuable means to test innovations and their impact within society. Fourthly, as AVs technologies are evolving, it could be interesting to apply a longitudinal lens of analysis, investigating how user acceptance changes over time. The road test would also allow the integration of other IDT variables that were not analyzed in this study, with new forms of integration between the TAM and IDT to be explored. In addition to this, the experimental context and the integration with the external environment could help in a deeper analysis of the perceived safety risk antecedents, as other kinds of risks could be associated with AVs. Finally, future research could extend the sample to other countries, analyzing how cultural and contextual differences might affect the adoption of AVs, to corroborate the results.

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Appendix A

Construct (no. of items)	Item	Conceptualization	Source
Intention to use (4)	INT1 I intend to use autonomous vehicles in the future.	The degree to which a person intends to use an AV in the future	Davis (1989)
	INT2 Assuming I had access to an autonomous vehicle, I would use it.		
	INT3 If I had access to an autonomous vehicle, I think that I would use it.		
	INT4 I will think about using an AV in the future.		
Perceived Usefulness (5)	PU1 Autonomous vehicles will let me do other tasks on my journey, such as eating, watching a movie, using a mobile telephone.	The degree to which a person believes that using an AV would improve their performance.	Davis (1989)
	PU2 Using AVs will decrease the risk of an accident.		
	PU3 Using AVs will relieve my stress of driving.		
	PU4 Using AVs would increase my productivity.		
	PU5 I think AVs will be useful when I'm impaired (e.g., drowsy, drunk, on drugs).		
Perceived ease of use (3)	PEOU1 I expect AVs will be easy to use.	The degree to which a person believes that using an AV will be free from effort	Davis (1989)
	PEOU2 I will find it easy to get AVs to do what I want them to do.		
	PEOU3 It will be easy for me to become skillful at using AVs.		
Subjective Norms(5)	SN1 In general, the people I like would encourage me to use the system.	The extent to which a person perceives that others (e.g., family, friends, colleagues) would say that they should use an AV	Taylor and Todd (1995)
	SN2 The people who influence me would say that I should use an AV.		
	SN3 The people who influence my behavior would say that I should use an AV.		
	SN4 The people who are important to me think that I should use an AV.		
	SN5 The people I admire would encourage me to use the system.		
Perceived safety risk (5)	PR1 Using AVs would be risky.	The extent to which a person believes that an AV will behave as expected	Pavlou (2003) Choi and Ji (2015)
	PR2 The safety of AVs may not meet my expectations		
	PR3 I worry about whether AVs will provide the level of benefits I expect		
	PR4 AVs may not be safe, i.e., they may be (or become) dangerous or harmful		
	PR5 Danger may arise due to a user's misuse of an AV.		
Carsharing Compatibility (3)	CS1 Carsharing is compatible with all aspects of my life.	The degree to which a person's lifestyle fits into carsharing	Han *et al.*, 2019
	CS2 Carsharing fits into my lifestyle		
	CS3 Carsharing fits well with my needs.		

Source: Authors' analysis

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Environmental, social and governance (ESG) performance: Does it pay back in terms of corporate brand value?[1]

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Michela Mingione - Francesco Laviola - Elaheh Anjomrouz
Carmela Di Guida - Salvatore Esposito De Falco

Abstract

Frame of the research: *This study contributes to various research domains of interest such as branding and corporate branding, corporate governance, environmental, social and governance (ESG) and, more generally, sustainability and society well-being.*

Purpose of the paper: *This paper advances hypotheses linking the corporate brand value to ESG performance.*

Methodology*: The study tests hypothesis by applying linear regressions on cross-sectional 2021 data, built on the corporate brand value of the world's top leading brands, whose ESG score has been retrieved from the Refinitiv™ database. In particular, the corporate brand value has been operationalized by means of the Interbrand listing.*

Results*: Findings show a positive relationship between the corporate brand value and the ESG social dimension, whereas the impact of the other ESG dimensions have been found not significant. Moreover, findings shed light on the positive link between the corporate brand value ESG controversies, moderated by the social dimension.*

Research limitations: *This paper is based on a sample retrieved from the 2021 Interbrand listing, with the related 2021 Refinitiv™ data, hence further studies are needed to investigate longitudinal effects stemming from the link between corporate brand value and ESG performance.*

Managerial implications: *Corporate managers should be aware of the specific effects of each ESG factor on the overall brand value. However, in parallel with a more focalized view on ESG dimensions, we also suggest a holistic approach to ESG management and branding by undertaking an inside-out and outside-in approach to infuse ESG dimensions internally and externally.*

Originality of the paper: *This is the first study that links the corporate brand value of top global brands to their ESG performance, highlighting the distinct impact of the social component and controversies.*

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Keywords: *financial value; brand value; environmental; social; governance; Interbrand; ESG; Refinitiv.*

1. Introduction

In the current BANI (Brittle, Anxious, Non-Linear and Incomprehensible) world, corporate brands are playing a major role in creating and delivering value not only for their shareholders, but also for their stakeholders and for the entire planet (Donaldson and Preston, 1995; Iglesias *et al.*, 2023; Roper and Davies, 2007).

The consideration of social and environmental factors, along with the acknowledgment of the need for a multiple-stakeholder view, shed light on the failure of shareholders' primacy (Freeman, 1999; Grossman, 2005; Smith and Rönnegard, 2016). This is in line, in the words of Lantos (2001), with the concept that social responsibility must be conceived as "a balancing act: business must balance economic performance, ethical performance, and the balance must be achieved among various stakeholders". (Lantos, 2001, p. 601). In particular, Hillman and Keim (2001) observed that careful management of primary stakeholders (e.g., employees, customers, suppliers and communities) can also lead to shareholders' wealth.

Hence, from Milton Friedman calling for a profit- and shareholder-driven approach, both academics and practitioners are embracing the view of the pioneer Edward Freeman who highlighted the importance of integrating the multiple stakeholders' view into the strategy of the company (Freeman, 1984, 1994), which includes a collective responsibility, also shared with competitors, and willingness to transform the whole industry toward a more sustainable one (Lantos, 2001). Thus, the approach has evolved from shareholder capitalism, which does not involve stakeholders in the strategy of the firm, toward the corporation that is acting as a corporate citizen, where societal involvement is extensive (Godfrey, 2005).

In particular, the moral capital enhanced by strategies of corporate philanthropy can increase shareholder wealth by leveraging on intangible resources, such as *corporate brands*, which protect the company from potential risks (Abratt and Sacks, 1988; Godfrey, 2005; Surroca *et al.*, 2010). For instance, when corporate brands are based on a sustainable positioning, companies can achieve both transactional and reputational outcomes such as consumers' loyalty and advocacy behaviors (Du *et al.*, 2007). In fact, building a strong corporate brand positively impacts on shareholders' value (Guenther and Guenther, 2019) and is linked to re-purchase intentions, indicating its impact on stakeholders' willingness to be loyal to the corporate brand (van Riel *et al.*, 2005). Moreover, when corporate brands embrace sustainability, they can have a positive impact on employees' life satisfaction (Golob and Podnar, 2021), and can increase employees' retention (Meier and Cassar, 2018) and their willingness to co-create value with the company (Bhattacharya *et al.*, 2008). Moreover, when corporate brands act as good corporate citizens (Carroll, 1991; Naidoo and Abratt, 2018), macro-outcomes can also be achieved such as social welfare and citizens' quality of life (Bhattacharya *et al.*, 2004).

In this scenario, whilst corporate brands are called to be sustainable and more stakeholder-conscious (Iglesias *et al.*, 2023), companies are invited to make responsible investments, defined as "investment practices that integrate a consideration of ESG issues with the primary purpose of delivering higher-risk-adjusted financial returns" (Eccles and Viviers, 2011, p. 389). This implies that companies are called to authentically integrate an environmental, social and governance (ESG) framework into their strategy (Ferrell, 2021; Secinaro *et al.,* 2023) and to raise a collective awareness linking the potential relationship between the brand value and the ESG scores (Mazzù *et al.,* 2024).

Based on the above considerations and to answer the recent call for a deeper examination of ESG metrics' effectiveness (Atkins *et al.*, 2023; Esposito De Falco *et al.*, 2024, this paper advances hypotheses linking the corporate brand value to ESG performance and tests them by applying linear regressions. In particular, the present study makes use of cross-sectional data, built on the corporate brand value of the world's top leading brands, as indicated by the Interbrand Best Global Brands Ranking, whose ESG score has been retrieved from the Refinitiv™ database. In acknowledging the need for "granular" research on ESG (Edmans, 2023), this study considers the three ESG dimensions separately, as well as ESG controversies.

2. Literature review and hypothesis development

2.1 Corporate brand value

By acknowledging that ESG performance is only linked to the corporation and not to its products or services, it is important to undertake a corporate brand perspective that - if compared with a product brand perspective - has a wider scope that goes far beyond the selling of brand products (Hatch and Schultz, 2008; Nascimento and Loureiro, 2024). Corporate brands are strong assets uniquely representing the organization (i.e., the corporation) (Aaker, 2004; Balmer, 2012), and playing a major role in creating and delivering value for their stakeholders (Iglesias *et al.*, 2023) such as investors, customers, employees, suppliers, governments, trade associations, communities and political groups, amongst others (Donaldson and Preston, 1995; Ind, 1997, 1998).

Corporate brands can categorize stakeholders based on their needs and expectations and prioritize them based on their mutual dependence and strategic significance (Jones, 2005). When stakeholders significantly contribute to determining the value base of a corporate brand (Gregory, 2007), they are also involved in the corporation's strategy, thereby leading to corporate brand value co-creation (Ind *et al.*, 2017). In particular, in order to create and maintain value during dyadic (Aarikka-Stenroos and Jaakkola, 2012; Mingione *et al.*, 2020) and network-based relationships (Merz *et al.*, 2009, 2018), corporate brand managers are called to involve stakeholders during corporate brand processes (Iglesias *et al.*, 2013; Ind *et al.*, 2013) by sharing information, activating a feedback system, and by having a constant dialogue between them (Edinger-Schons *et al.*, 2020).

By taking this perspective, we can affirm that the corporate brand "value resides in the actions, interactions, and projects that acquired resources make possible or support" (Schau *et al.*, 2009, p. 31).

Beyond the value stemming from relations and interactions, a purely positivist view of corporate brands (Mingione and Abratt, 2022) conceives them as objects legally owned by the corporation, which can also be turned into liquid assets with financial value (Aaker, 2004; Balmer and Gray, 2003). In particular, building a strong corporate brand positively impacts on shareholders' value (Guenther and Guenther, 2019) and is linked to re-purchase intentions, indicating its impact on stakeholders' willingness to loyalty (van Riel *et al.*, 2005).

Given the relevance of the ranking Best Global Brands of Interbrand, various scholars have operationalized the brand value by means of the Interbrand listing (Harjoto and Salas, 2017; Madden *et al.*, 2006; Melo and Galan, 2011). For instance, Melo and Galan's (2011) methodology considered: financial strengths, driving factor for consumer selection and prospect to create brand revenue. Moreover, Madden *et al.* (2006) used the Interbrand ranking to explore how brands can create financial value for shareholders. Specifically, they considered the following dimensions: 1) market segmentation; 2) financial analysis; 3) role of brand analysis; 4) brand strength analysis; and 5) brand value calculations. It is interesting to note the evolution of Interbrand itself in calculating the value of brands, with measurement taking into consideration dimensions that reflect current trends and challenges: 1) human truth (i.e., people/societal change oriented); 2) economic (financial); and 3) experiences (interactions/co-creation (Interbrand, 2021). Hence, in accordance with the above considerations, the novel methodology of Interbrand sheds light on the relational and economic dimensions of brands. However, Interbrand also introduces a new key driver of brand value, namely human truth.

In particular, human truth increases the value of the brand because it authentically integrates sustainability in the core purpose of its positioning, thereby impeding brand controversies such as woke washing (Mirzaei *et al.*, 2022; Vredenburg *et al.*, 2020) and greenwashing (Vollero *et al.*, 2016). In other words, human truth on sustainability must be reflected in the brand's strategy and communication (Lai *et al.*, 2010), in the corporate purpose (Iglesias *et al.*, 2023), and in the corporations' ESG compliance (Puriwat and Tripopsakul, 2023). In fact, scholars have found that environmental and social disclosure positively influence the value of the brand (Zampone *et al.*, 2021). The following three sections deepen the above thoughts by reviewing: i) the inherent value of a corporation's environmental, social and governance obligations; ii) the role of controversies in the ESG framework; and iii) the brand value, CSR considerations, ESG and controversy considerations. In a later section, this paper develops hypotheses by linking the brand value to ESG dimensions and to ESG controversies.

2.2 The inherent value of a corporation's ESG obligations

The concept of ESG - given the presence of multiple perspectives and the lack of standardized measurement methods - currently lacks a unified definition (Esposito de Falco *et al.*, 2024; Li *et al.*, 2021). However, we can rely on the European Commission's (2024a) definition, which conceives ESG as "a framework or criteria to measure the sustainability and ethical impact of an investment or a company focusing on three fields: Environmental, Social and Corporate Governance".

In the last thirty years, there has been notable growth of global corporations adopting ESG measures, with only twenty companies reporting ESG in the early Nineties, almost 9,000 companies in 2016 (Amel-Zadeh and Serafeim, 2018), and to date - according to Refinitiv (2024) - 40,000 companies reporting ESG across 90 Countries. Alongside this growth, there has been an increased interest from investors, with approximately 1,400 endorsers of the UN Principles for Responsible Investment by 2016, collectively supervising assets valued at approximately US$60 trillion (Amel-Zadeh and Serafeim, 2018).

Since the affirmation of the stakeholder theory (Freeman, 1999), the positive relationship between sustainable efforts and the corporation's financial performance has allowed companies to balance the needs of all stakeholders, thereby also including shareholders' interest (Clementino and Perkins, 2021; Cornell and Shapiro, 2021; Fiore *et al.*, 2020; Jensen, 2001; Malik, 2015; Porter and Kramer, 2006). In fact, this is supported not only by academics, but also backed up by institutional consolidation (Avetisyan and Hockerts, 2017; Erhemjamts and Huang, 2019), in alignment with the European Commission (2024a), which warns that "while the term ESG is often used in the context of investing, stakeholders include also customers, suppliers, and employees, all of whom are increasingly interested in how sustainable an organisation's operations are".

The inherent value of a corporation's ESG obligations stems from the nexus between ESG reporting and CSR disclosure (Fahad and Busru, 2021; Khan, 2022; Miglietta, 2022) - and the company's financial performance (Bansal *et al.*, 2021; Baran *et al.*, 2022; Feng and Wu, 2021; Huang, 2021). For instance, Koller *et al.* (2019) observed that ESG create value by "facilitating top-line growth, reducing costs, minimizing regulatory and legal interventions, increasing employee productivity, and optimizing investment and capital expenditures...Among other advantages, executing ESG effectively can help combat rising operating expenses (such as raw-material costs and the true cost of water or carbon)". Moreover, Benlemlih and Girerd-Potin (2017) observed that the value is also linked to the company's financial risk reduction. In particular, the positive link between ESG disclosure and the corporation's performance has been studied across diverse sectors such as the software industry (Kim *et al.*, 2018) and the energy industry (Hurduzeu *et al.*, 2022).

Despite the inherent value of a superior ESG performance, not all companies approach ESG in the same manner. For instance, Clementino and Perkins (2021) found that companies show different degrees of ESG compliance and engagement. Hence, whilst companies that enact a passive resistance to ESG do not believe that ESG can drive change and bring real value to the company, those companies who actively conform to ESG authentically align to ESG principles by integrating them in the corporation's strategy (Clementino and Perkins, 2021).

2.2.1 Digging into ESG: focusing on the value stemming from each ESG dimension

In acknowledging the need for "granular" research on ESG (Edmans, 2023), it has been deemed necessary to observe environmental, social and governance dimensions separately. First, companies are called to deal with environmental concerns, which "might include climate change mitigation and adaptation, as well as the environment more broadly, for instance the preservation of biodiversity, pollution prevention and the circular economy" (European Commission, 2024b). In particular, environmental practices lead not only to reputation as a long-term benefit, but also diminish the financial volatility of companies, increasing their chances of surviving in the industrial marketplace (Ortiz-de-Mandojana and Bansal, 2016). Moreover, scholars observed that whilst resource commitment to green initiatives and operational capabilities have a positive impact on financial performance (Richey Jr. *et al.*, 2014), Marsat *et al.* (2022) found that when companies have been consistent in their prior environmental commitments, they can more easily recover from potential emerging controversies. Finally, it is important to highlight those scholars who, in relation to environmental concerns, have claimed that the selection of key indicators (e.g., reduced carbon footprint, energy saving) and the measurement and assessment of the generated value represent core steps in also developing value for the corporation's industrial partners (Patala *et al.*, 2016; Rahman *et al.*, 2014).

Second, companies are called to deal with social concerns, which "refer to issues of inequality, inclusiveness, labour relations, investment in people and their skills and communities, as well as human rights issues" (European Commission, 2024b). In particular, as highlighted by Becchetti *et al.* (2022), this dimension is starting to play an even more important role than previously recognized (van Rekom *et al.*, 2013) in the ESG framework. This is due to the social complexity highlighted in the above-cited BANI world, even more enhanced by the recent pandemic Covid-19 (He and Harris, 2020), by the Russian-Ukraine war (Becchetti *et al.*, 2022), and by the very recent war between Israel and Palestine. Moreover, Millennials and Gen Z are a generational cohort that poses significant value to the authenticity and transparency of social aspects, being also ready to pay a premium price when companies offer sustainable brands and support social causes (Lyon *et al.*, 2018; Rank and Contreras, 2021). Accordingly, companies are starting to take a stance on socio-political issues such as gender equality enhanced with femvertising campaigns (Hsu, 2017; Sterbenk *et al.*, 2022), or advancing equality in the fight for equity, for instance with anti-racism campaigns (Dunivin *et al.*, 2022; Eyada, 2020), or with LGBTQ+ campaigns (Lim and Young, 2021). In general, by reviewing existent studies, scholars support the existence of a positive relationship between a corporation's social efforts and its financial performance (Dam and Scholtens, 2015); thereby, companies should be aware of the importance of social auditing, which measures the efficacy of their CSR practices (Maignan *et al.*, 2005). In fact, as Maignan *et al.* (2005, p. 971) highlighted in their stakeholder model, "without a reliable measurement of the achievement of social objectives, a company has no concrete way to verify their importance, link to organizational performance, or justify expenditures to stakeholders". To overcome these challenges, external consultancies may measure CSR performance (Polonsky and Jevons, 2006). Moreover, in line with the stakeholder-based approach of the present study, Becchetti *et al.* (2022, p. 1) suggested that in order to enhance "the value of that pillar, it is necessary to assess both the internal and external relationships of the firm from an impact perspective, improving at the same time the multidimensional well-being of workers and the capacity to create sustainable development in the local community".

Third, and in line with the above, the importance of relationships and engagement strongly emerge in the Governance dimension, which also includes the consideration of environmental and social concerns. In fact, as suggested by the European Commission (2024b), the governance of "public and private institutions - including management structures, employee relations and executive remuneration - plays a fundamental role in ensuring the inclusion of social and environmental considerations in the decision-making process". In particular, the engagement of stakeholders requires a continuous dialogue and foresees access to the corporation as key to succeeding in its strategies (Hatch and Schultz, 2010). This approach entails a high degree of self-disclosure, where the corporate brand acts as a transparent actor who opens up and reveals its managerial strategies and actions to their stakeholders (Hatch and Schultz, 2010). In particular, Maon *et al.* (2021) observed that internal and external stakeholders belonging to the corporate ecosystem influence the corporation's identity (i.e., by including internal stakeholders) and the corporation's reputation (i.e., by including external stakeholders). This approach is at the basis of a new democratic era, which allows stakeholders to "participate in the process of organizing, decision-making, and governance in corporations" (Edinger-Schons *et al.*, 2020, p. 511).

2.3 Hypothesis development

2.3.1 Linking corporate brand value, CSR, and the corporation's ESG performance

In the marketing domain, CSR (corporate social responsibility) represents a long-term investment, having a positive impact on corporate brand value (Melo and Galan, 2011; Minor and Morgan, 2011).

By digging into the studies that explored the specific relationship between CSR activities and financial performances, scholars showed that CSR can drive market value, in the forms of Tobin's q, stock returns (Luo and Bhattacharya, 2006) and risk and cost reduction (Knox and Maklan, 2004; Luo and Bhattacharya, 2009). Moreover, Orlitzky *et al.* (2003) found a positive relationship between CSR and performance; however, McWilliams and Siegel (2000) and Surroca *et al.* (2020) found no direct relationships, actually moderated by the operationalization of performance (Orlitzky *et al.*, 2003), which confirms the importance of finding standard CSR measurements (Knox and Maklan, 2004; Polonsky and Jevons, 2006).

At present, there have been fragmented attempts to link brand value to the ESG scores. For instance, Lee *et al.* (2022) revealed that brands tend to signal their ESG performance through direct and collaborative sharing of ESG information. Moreover, whilst Paolone *et al.* (2022) qualitatively found that ESG pillars drive higher levels of marketing performance, other authors offered quantitative studies revealing the positive impact of ESG scores on brand image, customers' purchase intentions (Puriwat and Tripopsakul, 2023) and brand reputation (Yu *et al.*, 2023). Further, some studies discovered that only the social and governance dimensions have a direct effect on brand image, brand attitude (Koh *et al.*, 2022), brand credibility and perceived quality (Lee and Rhee, 2023). Additionally, a very recent article discovered that corporate ethical responsibility impacts on the corporate brand identity, positively influencing environmental and social performances (Bag *et al.*, 2024).

By drawing on the above literature review and in accordance with Edmans (2023), suggesting that each ESG dimension plays a specific role in driving value, this paper develops the following hypotheses:

HP1: The Environmental score is positively related to the corporate brand value

HP2: The Social score is positively related to the corporate brand value

HP3: The Governance score is positively related to the corporate brand value

2.3.2 The key role of authenticity and legitimacy: the impact of ESG controversies on corporate brand value

In this scenario, it is important to underline the key role played by credibility, authenticity (Iglesias *et al.*, 2019; Hur *et al.*, 2014; Neher *et al.*, 2022) and corporate transparency (Heinberg *et al.*, 2020). In fact, the authenticity of CSR strategies and actions is central to increasing the corporate brand value (Nirino *et al.*, 2019) and, more specifically, stakeholders' purchase intentions (Afzali and Kim, 2021), customers' WOM and brand loyalty (Markovic *et al.*, 2018). Moreover, Zampone *et al.* (2021) found that environmental and social disclosure positively influence the value of the brand.

Conversely, scholars have found that when corporate brands are not authentic in their purposes - without genuinely supporting what is actually communicated to stakeholders - they are conceived as hypocritical (Klein and Dawar, 2004; Korschun *et al.*, 2016) and can be accused of greenwashing and woke washing, which may have serious negative consequences on the corporate brand value (Harjoto and Salas, 2017; Mirzaei *et al.*, 2022; Vredenburg *et al.*, 2020). Moreover, when CSR and sustainability practices are not supported by a brand conscience throughout the entire value chain, companies could experience a lack of authenticity and credibility, which in turn deteriorate the brand value (Iglesias *et al.*, 2023; Wilson and Morgan, 2011). For instance, the absence of supplier credibility represents an important barrier to take on environmentally sustainable offerings (Ramirez *et al.*, 2014), which may also trigger a greenwashing effect that could be recovered by adopting specific brand trust repair strategies (Guo *et al.*, 2018).

For the potential backlashes of CSR and the consequential stigmatization of CSR (Warren, 2022), Harjoto and Salas (2017) divided CSR into CSR strengths (proactive strategic CSR activities) and CSR concerns (socially irresponsible activities), revealing - respectively - their positive and negative effects on the brand value. Remarkably, in the ESG context, CSR concerns (e.g., corporate wrongdoing, greenwashing, woke washing) are referred as to ESG controversies (Aouadi and Marsat, 2018; Nirino *et al.*, 2021).

ESG controversies relate "to corporate environmental, social, and governance news stories such as suspicious social behavior and product-harm scandals that place a firm under the media spotlight and, by extension, grab investors' attention" (Aouadi and Marsat, 2018, p. 1027). Consequently, controversies represent a significant barrier to the corporation's ESG performance by negatively affecting the company's value (Nirino *et al.*, 2021), and by posing significant challenges to its organizational legitimacy (Palazzo and Scherer, 2006). In particular, organizational legitimacy is key to avoiding stakeholders' skepticism (Skarmeas and Leonidou, 2013) on potential greenwashing on ESG disclosure (Yu *et al.*, 2020) and to triggering isomorphic sustainable practices of all stakeholders who align to the same value creating system (Taylor *et al.*, 2021). Accordingly, Martín-de Castro (2021) observed that to achieve corporate legitimacy, organizations are called to co-create shared value with stakeholders belonging to their market (e.g., customers, suppliers, competitors) and beyond the market stakeholders (e.g., media, NGOs, citizens). Further, suppliers also play a key role in building and maintaining the corporation's legitimacy. When suppliers are positively perceived in terms of sustainable practices, the industrial brand equity of both suppliers and buyers shows a superior performance (Lai *et al.*, 2010). Conversely, the absence of supplier credibility represents an important barrier in taking on environmentally sustainable offerings (Ramirez *et al.*, 2014) and triggers a greenwashing effect, which could be recovered by adopting specific brand trust repair strategies (Guo *et al.*, 2018).

The above scenario, supported by the negative relationship between ESG controversies and the company's financial value, as observed by several scholars (La Rosa and Bernini, 2022; Li *et al.*, 2019; Nirino *et al.*, 2021), leads this study to the following hypotheses:

HP4: ESG controversies are negatively related to the corporate brand value

HP5: The relationship between ESG controversies and brand value is moderated by the Environmental Score (a), the Social Score (b), and the Governance Score (c)

HP6: Second-order moderation effects influence the relationship between ESG scores and brand value (a) and the relationship between ESG controversies and brand value (b)

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3. Methodology

This paper uses cross-sectional data, including the brand values and rankings from Interbrand Global Ranking for the year 2021, and links them to the ESG scores provided by LSE Refinitiv™ - previously Thomson Reuters Eikon - one of the largest international rating agencies serving as a reference point for investors wishing to allocate their investments in companies that perform well in environmental, social and governance practices (Duque-Grisales and Aguilera-Caracuel, 2021). Thereby, this study relies on two main data sources, the Interbrand Global Ranking (2021) data source in relation to the brand values and the LSE Refinitiv™ data source concerning the ESG values. In line with this, whilst the brand values have been operationalized by means of the Interbrand listing, the ESG values have been operationalized by means of LSE Refinitiv ™, implying that this study could only consider values that were included in both data sources. For this reason, in the Interbrand ranking we could only refer to corporate brand values because the ESG ratings are only related to corporations (i.e., the value of each product brand has not been considered). Hence, for instance, the product brands Sephora and Tiffany have been linked to their corporate brand Louis Vuitton. Moreover, some brands (Chanel, YouTube, Ikea, Gucci, Zara, Pampers, LEGO, Red Bull, Gillette, Cartier, Ferrari, Corona, DHL, Jack Daniel's, Huawei, Hennesy, KFC, and Land Rover) have no ESG-data available. The final sample comprised 74 brands.

Thanks to the Refinitiv™ database, we had access to the data presented in Table 1. Of note, Refinitiv™ calculates Controversies on the basis of the number of published media news stories on a brand's negative behavior. It is important to also note that in our analysis, we have converted the Social Score (SS), Governance Score (GS) and Environmental Score (ES) from their original categorical representations (ranging from "A+" indicating excellent performance to "D-" indicating poor performance) into numerical variables for ease of analysis.

Tab. 1: An exemplification of the employed dataset

<table>
<tr><th>Brand Value</th><th>ESG Combined Score*</th><th>Theme</th><th>Score*</th><th>Weight</th><th>Sub-theme</th><th>Score*</th><th>Weight</th><th>Controversies Score</th><th>Nr. (E,S,G)</th></tr>
<tr><td rowspan="11">$m</td><td rowspan="11">"A+","A","A-","B+","B","B-","C+","C","C-","D+","D","D-"</td><td rowspan="3">Environmental</td><td rowspan="3">"A+","A","A-","B+","B","B-","C+","C","C-","D+","D","D-"</td><td rowspan="3">%</td><td>Resorce Use</td><td>*</td><td>%</td><td rowspan="11">"A+","A","A-","B+","B","B-","C+","C","C-","D+","D","D-"</td><td rowspan="3">nr.</td></tr>
<tr><td>Emissions</td><td>*</td><td>%</td></tr>
<tr><td>Innovation</td><td>*</td><td>%</td></tr>
<tr><td rowspan="5">Social</td><td rowspan="5">"A+","A","A-","B+","B","B-","C+","C","C-","D+","D","D-"</td><td rowspan="5">%</td><td>Workforce</td><td>*</td><td>%</td><td rowspan="5">nr.</td></tr>
<tr><td>Human Rights</td><td>*</td><td>%</td></tr>
<tr><td>Community</td><td>*</td><td>%</td></tr>
<tr><td>Product</td><td></td><td></td></tr>
<tr><td>Responsibility</td><td>*</td><td>%</td></tr>
<tr><td rowspan="3">Governance</td><td rowspan="3">"A+","A","A-","B+","B","B-","C+","C","C-","D+","D","D-"</td><td rowspan="3">%</td><td>Management</td><td>*</td><td>%</td><td rowspan="3">nr.</td></tr>
<tr><td>Shareholders</td><td>*</td><td>%</td></tr>
<tr><td>CSR Strategy</td><td>*</td><td>%</td></tr>
</table>

Source: our elaboration

The transformation of the scores was necessary for the regression analysis. We assigned a value of 1 to "A+" (excellent) and a value of 12 to "D-" (poor). It is important to note that due to this transformation, the interpretation of the coefficients in the regression results will be inverse. In other words, an increase in SS, GS or ES implies a deterioration in the respective score, as it indicates a transition from better to worse scores. This aspect should be carefully considered when interpreting the results.

Our statistical analysis began with a basic multiple linear regression model, where the dependent variable was 'Brand value 2021' and the independent variables were 'NrC' (Number of Controversies), 'ES', 'SS' and 'GS'. The independent variables were standardized, a process that rescales the variables to have a mean of 0 and a standard deviation of 1.

Standardization is important in regression analysis for several reasons. Firstly, it simplifies the computation of sample covariances and correlations. Secondly, it reduces multicollinearity and the associated problems that are caused by higher-order terms. Thirdly, it allows for a comparison of the effect that different predictor variables have on the response variable. Lastly, it ensures that each variable is measured on the same scale, so the absolute values of the regression coefficients can be compared to understand which variables have the greatest effect on the response variable (Allen, 1997).

After this preliminary step, we tested a model with interaction terms to increase the explanatory power of the model and capture the complex interactions between independent variables. Interaction effects in regression analysis allow the effect of one independent variable on the dependent variable to depend on the value of another independent variable. This can provide a more nuanced understanding of the relationships between the variables and can reveal important insights that might be missed in a model without interaction terms (Andersson *et al.*, 2014; Jaccard *et al.*, 1990; Murphy and Aguinis, 2022).

Finally, we applied the stepwise regression method to the model with interaction terms. Stepwise regression is an automatic method that is particularly useful in exploratory studies with multiple variables for estimating multivariate linear models. It selects the most useful explanatory variables based on statistical significance (Engelmann, 2023; Lewis, 2007). After applying the stepwise method, we arrived at the final model, which included the main effects of the standardized independent variables and selected interaction terms. This model provides a balance between complexity and interpretability, allowing for a nuanced understanding of the relationships between the variables while avoiding overfitting.

4. Descriptive statistics

Before describing the results of our linear regression model, it is relevant to present the general descriptive statistics of our selected sample (see Fig. 1 and Fig. 2). By examining Figures 1 and 2, we can: i) gain a clear understanding of the sectors analyzed; ii) identify which of the analyzed sectors dominate the Interbrand ranking, specifically automotive, financial service, and technology; and iii) observe that the brand value is primarily concentrated in the hands of technology brands.

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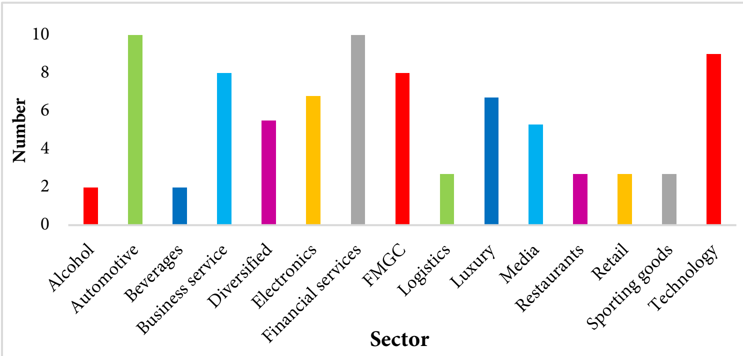
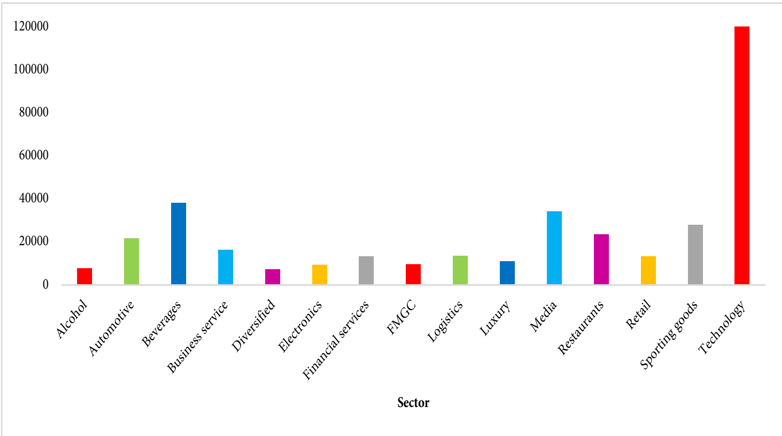
Fig. 1: Number of firms by sector



Source: our elaboration

Fig. 2: Scores by brand mean value

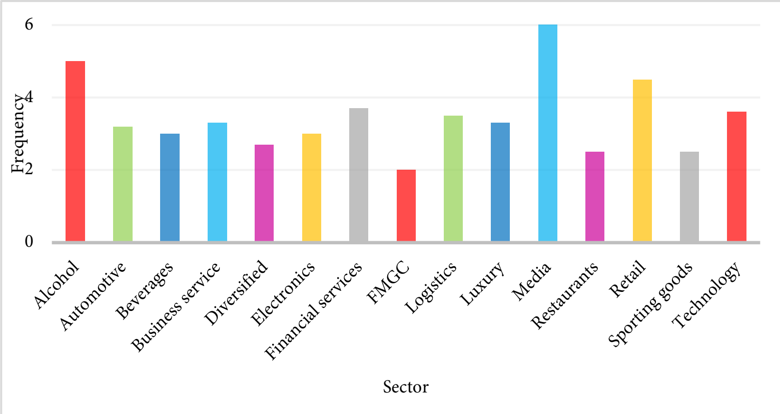


Source: our elaboration

Moreover, it is possible to observe ESG performance, both in terms of single constituents (environmental, social and governance), as well as controversies by sector (Figg. 3, 4, 5, 6).

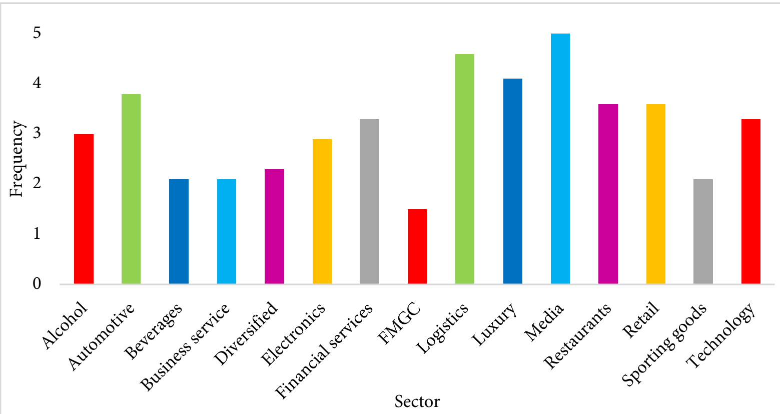
In particular, Figures 3, 4, 5 and 6 outline that: i) Environmental issues are distributed relatively equally, with the three sectors of Alcohol, Media and Retail making the greatest contribution to Environmental efforts, while the Electronics sector makes less effort in this regard; ii) Social issues are distributed relatively equally, with the four sectors of Automotive, Logistics, Luxury and Media making the greatest contribution to Social efforts, and the Electronics sector confirming low effort also in this regard; iii) The distribution of efforts is similar in the case of governance issues, with the sectors of Alcohol, Luxury, Media and Restaurants pursuing the major governance efforts, while the Beverages sector makes less effort; and iv) In terms of Controversies, there is a notable imbalance, with the majority concentrated in the Automotive, Media and Technology sectors. Of these, the Technology sector is the most prone to Controversies.

Fig. 3: Environmental scores mean value by sector



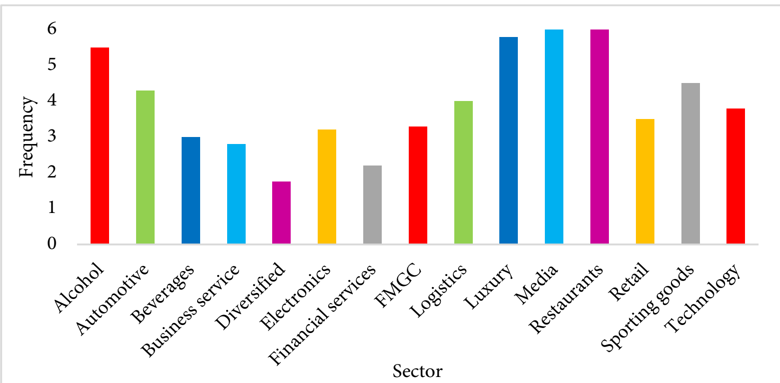
Source: our elaboration

Fig. 4: Social scores mean value by sector



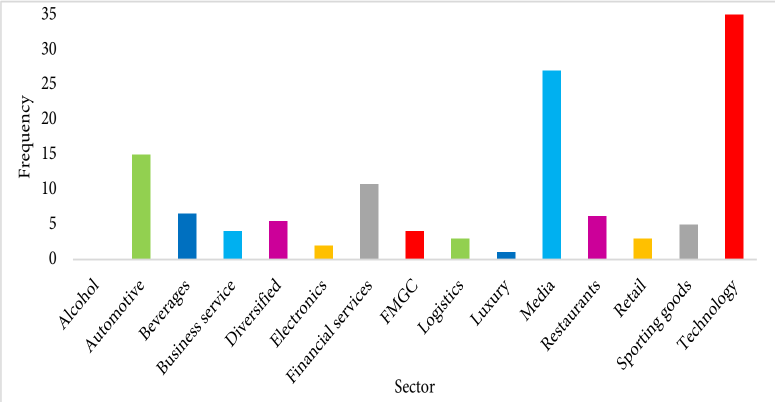
Source: our elaboration

Fig. 5: Governance scores mean value by sector



Source: our elaboration

Fig. 6: Controversies scores mean value by sector



Source: our elaboration

5. Results

As Table 2 shows, the adjusted R-squared value of 0.7918 implies that the model displays 79.18% of the variability in Brand Value (2021). The F-statistic and its associated p-value (< 2.2e-16) suggest that at least one of the predictors significantly relates to Brand Value (2021). In particular, we can affirm that the model reveals complex relationships between brand value and the predictors, with significant interactions. The estimated linear functions for each predictor are summarized in Fig. 7.

In our analysis, we scrutinized several hypotheses pertaining to the relationship between various environmental, social and governance (ESG) factors and brand value. The first hypothesis (HP1) posited a positive relationship between the Environmental Score (ES) and brand value. However, the empirical results did not support this hypothesis. The coefficient for ES was found to be statistically insignificant with a p-value of 0.15604, which is greater than the conventional threshold of 0.05. This suggests that the data does not provide strong evidence to conclude that ES has a significant impact on brand value.

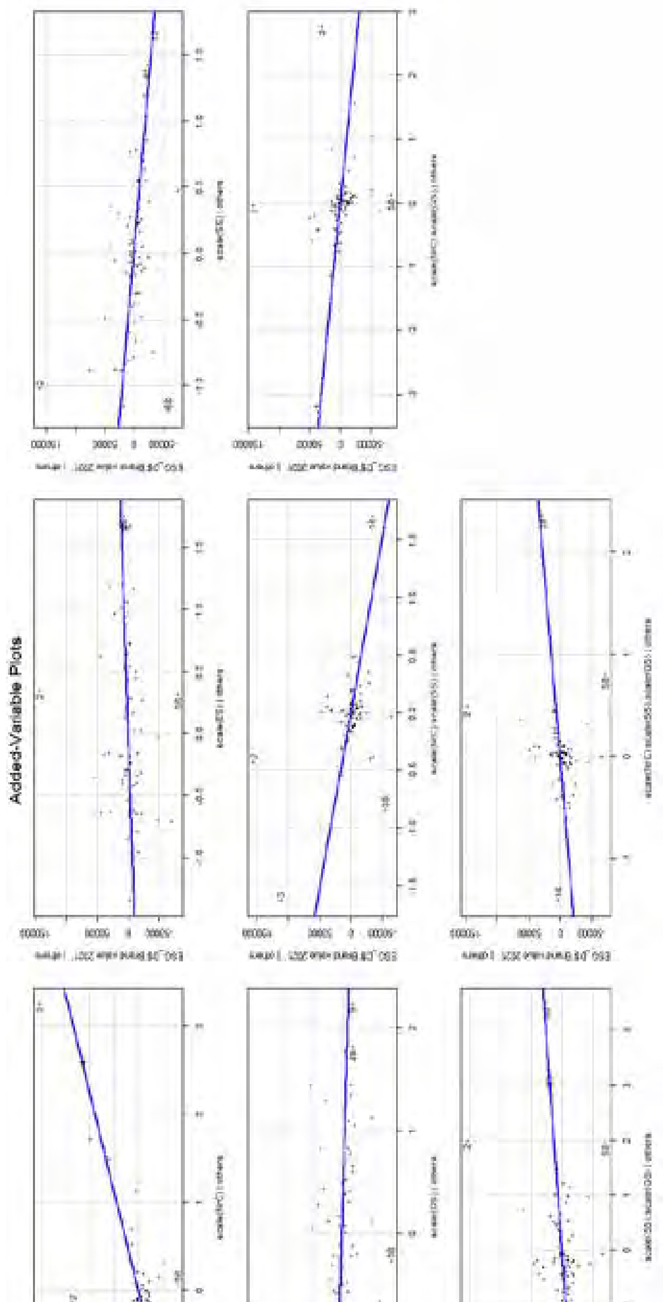
Tab. 2: Summary of the chosen regression model

<table>
<tr><td>Call:</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">lm (formula = ESG_D$`Brand value 2021` ~ scale (NrC) + scale (ES) + scale (SS) + scale (GS) + scale (NrC):scale (SS) + scale (NrC):scale (GS) + scale (SS):scale (GS) + scale (NrC):scale (SS):scale (GS), data = ESG_D)</td></tr>
<tr><td>Residuals:</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Min</td><td>1Q</td><td>Median</td><td>3Q</td><td>Max</td><td></td></tr>
<tr><td>-82414</td><td>-8710</td><td>-1262</td><td>5417</td><td>141445</td><td></td></tr>
<tr><td>Coefficients:</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td>Estimate</td><td>Std. Error</td><td>t value</td><td>Pr (>|t|)</td><td></td></tr>
<tr><td>(Intercept)</td><td>28541</td><td>3559</td><td>8.019</td><td>2.70E-11</td><td>***</td></tr>
<tr><td>scale (NrC)</td><td>44411</td><td>4837</td><td>9.182</td><td>2.37E-13</td><td>***</td></tr>
<tr><td>scale (ES)</td><td>6649</td><td>4633</td><td>1.435</td><td>0.15604</td><td></td></tr>
<tr><td>scale (SS)</td><td>-19771</td><td>5518</td><td>-3.583</td><td>0.00065</td><td>***</td></tr>
<tr><td>scale (GS)</td><td>-4870</td><td>3836</td><td>-1.27</td><td>0.2087</td><td></td></tr>
<tr><td>scale (NrC):scale (SS)</td><td>-32760</td><td>8279</td><td>-3.957</td><td>0.00019</td><td>***</td></tr>
<tr><td>scale (NrC):scale (GS)</td><td>-10414</td><td>5107</td><td>-2.039</td><td>0.04552</td><td>*</td></tr>
<tr><td>scale (SS):scale (GS)</td><td>6420</td><td>3313</td><td>1.938</td><td>0.057</td><td>.</td></tr>
<tr><td>scale (NrC):scale (SS):scale (GS)</td><td>13783</td><td>8120</td><td>1.697</td><td>0.0944</td><td>.</td></tr>
<tr><td>---</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1</td></tr>
<tr><td colspan="6">Residual standard error: 28320 on 65 degrees of freedom</td></tr>
<tr><td colspan="6">Multiple R-squared: 0.8146, Adjusted R-squared: 0.7918</td></tr>
<tr><td colspan="6">F-statistic: 35.7 on 8 and 65 DF, p-value: < 2.2e-16</td></tr>
</table>

* Note: the original categorical representations (from “A+” to “D-”) have been transformed into numerical variables. Hence, an increase in SS, GS or ES implies a deterioration in the respective score, as it indicates a transition from better to worse scores.

Source: Rstudio

Fig. 7: Regression model linear function estimates



Source: RStudio

Moving on to the second hypothesis (HP2), a positive relationship was proposed between the Social Score (SS) and brand value. The empirical results confirmed this hypothesis. The relationship was found to be negative and statistically significant with a coefficient of -19771 and a p-value of 0.00065, which is less than 0.05. This indicates that as the Social Score improves (as per our scores coding, a higher value in SS indicates a worse rating), the brand value increases. The third hypothesis (HP3) suggested a positive relationship between the Governance Score (GS) and brand value. However, the empirical results did not support this hypothesis. The coefficient for GS was found to be statistically insignificant with a p-value of 0.20870, which is greater than 0.05. This suggests that the data does not provide strong evidence to conclude that GS has a significant impact on brand value.

The fourth hypothesis (HP4) posited that ESG controversies are negatively related to brand value. Contrary to this hypothesis, the empirical results showed that the coefficient for NrC (number of controversies) is positive and statistically significant (coefficient = 44411, p-value < 0.001). This implies that as the number of controversies increases, the brand value also increases. HP5a proposed that the environmental score moderates the relationship between ESG controversies and brand value. However, the interaction model did not support this hypothesis, as the stepwise method threw out the corresponding interaction term. This suggests that the environmental score does not significantly influence the relationship between ESG controversies and brand value. HP5b posited that the social score moderates the relationship between ESG controversies and brand value. The empirical results confirmed this hypothesis. With respect to the coefficient for the interaction term scale (NrC): the scale (SS) was found to be -32760. This indicates that the effect of NrC on Brand value 2021 decreases by approximately $32760 billion for each standard deviation increase in SS (as per our scores coding, a higher value in SS indicates a worse rating), assuming all other variables are held constant (Table 2). The effect of ESG controversies on brand value is not constant, but also depends on the Social Score. Specifically, as the Social Score deteriorates (an increase in SS indicates a worse rating), the standalone positive impact of controversies on the brand value decreases. This means that for companies with a worse Social Score, controversies have less of a positive impact on the brand value.

HP5c posited that the governance score moderates the relationship between ESG controversies and brand value. The empirical results provided some support for this hypothesis. In particular, for the coefficient for scale (NrC): the scale (GS) is -10414, suggesting that the effect of NrC on Brand value 2021 decreases by approximately $10414 billion for each standard deviation increase in GS, assuming all other variables are held constant. The effect of ESG controversies on brand value is not constant, but also depends on the Governance Score. Specifically, as the Governance Score deteriorates (an increase in GS indicates a worse rating), the standalone positive impact of controversies on the brand value decreases. This means that for companies with a worse Governance Score, controversies have less of a positive impact on the brand value. However, since the main effect of GS is not significant, this interaction should be interpreted with caution. The hypotheses positing second-order moderation effects in the relationships between (H6a) ESG scores and brand value, and (H6b) ESG controversies and brand value, were not supported by the empirical results. For both hypotheses, most interaction terms were eliminated through the stepwise selection method, and the remaining interaction terms did not exhibit significant effects at conventional p-value thresholds.

Table 3 summarizes confirmation and disconfirmation of all the hypotheses considering our results.

Tab. 3: Analysis of hypotheses

Hypothesis	Relationship	Expectation	Result	HP confirmed?
HP1	ES BV	Positive*	Not Significant	No
HP2	SS BV	Positive*	Positive*	Yes
HP3	GS BV	Positive*	Not Significant	No
HP4	NrC BV	Negative	Positive	No
HP5a	NrC BV, moderated by ES	Significant	Not Significant	No
HP5b	NrC BV, moderated by SS	Significant	Significant, negatively moderated by SS	Yes
HP5c	NrC BV, moderated by GS	Significant	Significant, negatively moderated by GS	Yes
HP6a	ES, SS, GS BV with second order moderation effects	Significant	Not Significant	No
HP6b	NrC BV with second order moderation effects	Significant	Not Significant	No

*Note: the original categorical representations (from "A+" to "D-") have been transformed into numerical variables. Hence, an increase in SS, GS or ES implies a deterioration in the respective score, as it indicates a transition from better to worse scores. The table summarizes the results following the formulation of the hypotheses, not the reverse coding used for the regression analysis.

Source: Our elaboration

6. Discussion

6.1 Theoretical implications

This is the first study that links corporate brand value to ESG performance using cross-sectional data retrieved, respectively, from Interbrand Best Global Ranking and Refinitiv™. Hence, this study contributes to various research domains of interest, such as corporate marketing, corporate branding, corporate governance, ESG, and more generally, sustainability and society well-being.

This study has three main theoretical implications. First, it sheds light on the key role played by the social dimension on the corporate brand value. In particular, this is the only significant factor that positively impacts on the value, thereby assigning a major role to the social dimension in comparison with the other dimensions. This insight is in line with Atkins *et al.* (2023) and Becchetti *et al.* (2022) suggesting that - due to the Covid-19

Pandemic and the Ukraine-Russia and Israel-Palestine wars - a central role should be assigned to the social dimension within the ESG framework. In fact, the social dimension tries to overcome the limits posed by business concerns (Smith *et al.*, 2010), and highlights the need for establishing strategies and practices that are strategically integrated with global social well-being (Lindgreen *et al.*, 2012) by placing "stakeholders/customers along with societal concerns at the centre of their strategic deliberations" (Balmer, 2011, p. 1331).

In this scenario, corporations are called to create and manage a social consciousness that emphasizes the "impact of activities of a firm on advantages it receives such as reputation in a competitive marketplace" (Gupta *et al.*, 2014, p. 3). Hence, corporations and society are called to become intertwined partners aimed at ensuring social issues (Chandy *et al.*, 2021; Lantos, 2001; Porter and Kramer, 2006).

In order to achieve social consciousness, corporations should extend their purpose throughout the whole value chain and search for alignment with those partners who can help them to boost social issues and solve social concerns (Iglesias *et al.*, 2023; Mingione and Leoni, 2020). For instance, Sheth and Sinha (2015) claimed that purpose-driven brands acknowledge their role in the society as good citizens and feel intertwined with all the actors of the value chain, who extensively contribute to co-create a shared value committed to increasing the wellness of the society. In summary, brands cannot stay in their lane, but are called to be social (Smith *et al.*, 2010; Vredenburg *et al.*, 2020).

Second, a counterintuitive role of controversies emerged. In particular, ESG controversies have been associated with higher corporate values. These results are in line with Aouadi and Marsat (2018) who - by considering 3,000 controversies of 4,312 firms in the period 2002-2011 - revealed a positive relationship between ESG controversies and firm value. However, scholars highlighted that the positive relationship between ESG-firm value is significant for "for high-attention firms", i.e., those brands receiving major media attention (Capelle-Blancard and Petit, 2019; Aouadi and Marsat, 2018). This is in line with the results of our research that highlights major worldwide leading brands are not affected by controversies, which seem instead to be positively related to brand value. This implies that corporate brand value is linked to brand awareness and brand strength, despite controversies, leading to important considerations on the role played by credibility, authenticity (Iglesias *et al.*, 2019; Hur *et al.*, 2014; Neher *et al.*, 2022) and corporate transparency (Heinberg *et al.*, 2020). In fact, whilst literature supports the importance of these constructs, our result represents food for thought regarding greenwashing and woke washing (Vredenburg *et al.*, 2020), which have been strongly demonized by the literature, but seem not to have any significant effect on the overall value of the corporate brand. However, the present paper also observes that this relationship is actually moderated (only) by the social dimension, which further emphasizes the key role assigned to this specific ESG dimension (Atkins *et al.*, 2023; Becchetti *et al.*, 2022).

The unexpected result on controversies also sheds light on consumers' attitudes and behaviors. In fact, whilst consumers, especially Millennials and Gen Z (Lyon *et al.*, 2018; Rank and Contreras, 2021), call for sustainable companies, and when it comes to brand purchase and attitudes, they are probably more affected by brand awareness and brand experience. This implies that not only are companies called to ensure the alignment between promises and practices, but also consumers should close the gap between what they deem as most important in terms of sustainability and how they actually behave (White *et al.*, 2019).

Third, this study confirms bias-related problems when dealing with ESG data. In fact, Drempetic *et al.* (2020) found a positive relationship between the company's size and the ESG scores provided by Thomson Reuters, which has been later explained by Dobrick *et al.*'s (2023) study revealing size bias in the Refinitiv ESG data (ex-Thomson Routers). Remarkably, Barkemeyer *et al.* (2023) found further bias in the selection of ESG controversies media sources, highlighting the limits of these indices (Fiaschi *et al.*, 2020) and the need for complete ESG information (Edmans, 2023). These considerations might also help to understand the positive relationship between controversies and brand value that have emerged in this paper. In fact, those brands showing more controversies are the same brands that are under the media spotlight for their brand awareness and relevance.

6.2 Managerial implications

By tracing the development of potential links between the corporate brand value of top global brands to their ESG performance, this study suggests the following managerial implications. First, corporate managers should be aware of the prominent role of the social dimension contributing to the overall value of their corporate brand. This implies that managers should consider, in order to meet their business priorities - often linked to quartile profit maximization - strategies and practices that align with global social welfare, prioritizing societal issues as central elements in their strategic decision-making.

Second, the absence of a positive relationship between environmental and governance dimensions with the brand value highlights that managers should not discard these dimensions, but instead deepen this unexpected result by investigating which dimensions mostly contribute to brand value. For instance, if managers realize that consumer experience mostly impacts on brand value, in order to raise environmental consumers' awareness, they could include environmental concerns in the overall brand experience, in particular by linking emotional, affective, behavioral and intellectual experiences to environmental issues. Moreover, managers are called to expand their analysis by segmenting their sample on generational basis, given the prominence that new generations associate with environmental, social and governance concerns.

Third, and linked to the above, the unexpected result on controversies raises relevant managerial implications. In fact, the positive relationship between controversies and brand value, as highlighted in our theoretical implications, highlights the central role of media attention (Capelle-Blancard and Petit, 2019; Aouadi and Marsat, 2018). This implies that probably companies do not sufficiently communicate their ESG efforts to consumers, thereby impeding their overall contribution to the value of the brand. Therefore, managers are encouragednot only to pursue ESG strategies, but also strengthen their communication efforts in order to raise ESG awareness amongst consumers, especially young generations, such as Millennials, Gen Z and Gen Alpha, with the latter having a minor actual role, which will, however, increase in the next few years.

Based on the above, corporate managers should be aware of the specific effects of each ESG factor on the overall brand value. However, in parallel with a more focalized view on ESG dimensions, we also suggest a holistic approach to ESG management and branding, for instance by creating an ESG Global Brand Business Unit. Remarkably, beyond an ESG Global Brand Business Unit, which could be actually present in some corporations, we suggest that managers - at both top and middle levels - should infuse a corporate culture in their employees that encourages the corporation's ESG awareness by highlighting its relevance in influencing the overall value of the brand. In order to achieve a coherent and holistic strategy, the presence of an inside-out approach to social awareness also calls for an outside-in approach, where not only the entire corporation, but also external partners are invited to share the moral responsibility to address and resolve social challenges. Therefore, managers are encouraged to form interconnected partnerships that share mutual responsibilities in order to address and tackle ESG issues and integrate them across the entire value chain.

6.3 Limitations and directions for future research

This paper presents the following limitations: First, it is based on a sample retrieved from the 2021 Interbrand listing, with the related 2021 Refinitiv™ data, hence further studies are needed to investigate longitudinal effects stemming from the link between corporate brand value and ESG performance.

Second, as aforementioned in our theoretical implications, ESG data may have some bias-related problems, such as size bias of Refinitiv ESG data (Dobrick *et al.*, 2023) and media sources (Barkemeyer *et al.*, 2023). Hence, qualitative research could provide greater insights into understanding the perceptions of managers on a potential positive correlation between ESG controversies and brand value. Moreover, future studies could examine the impact of brand awareness and consumer loyalty in minimizing the negative effects of controversies.

Third, this paper uses linear correlation, while future research could go further by generating models that capture nonlinear and interaction effects such as machine learning algorithms for pattern recognition or hierarchical models for evaluating deep interactions within sectors. Finally, further work is encouraged to advance knowledge of the impact of consumer demographics, which might have a moderating influence on the relationship between ESG dimensions and brand value.

7. Conclusions

This study uses cross-sectional data from the Interbrand Best Global Rankings and Refinitiv™ to investigate the relationship between corporate brand value and ESG dimensions, making it a unique contribution to both academics and practitioners. In particular, the paper contributes to various research domains of interest, such as branding and corporate branding, corporate governance, ESG and, more generally, sustainability and society well-being. Expected and unexpected results were found (i.e., a positive relationship between the corporate brand value, and: i) the ESG social dimension and ii) ESG controversies), shedding light on the relevant complexity that still characterizes this field. In fact, in parallel with a more focalized view on ESG dimensions, this paper strongly recommends a holistic approach to ESG management and branding by undertaking an inside-out and outside-in approach to infuse ESG dimensions internally and externally.

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Beyond sustainability: a systematic literature review on climate change through the lens of stakeholder orientation[1]

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Abstract

Frame of the research. *The escalating interest in addressing the challenges presented by climate change has led to a significant increase in research within this domain, necessitating a systematic organization. This study provides a comprehensive summary of the expanding realm of climate change research, emphasizing the progression of scholarly exploration over the past 28 years. Additionally, it underscores the importance of examining this evolution from the perspective of stakeholder orientation. This focus is crucial given that stakeholders represent one of the primary forces compelling companies to undertake climate change initiatives.*

Purpose of the paper. *The purpose of this study was twofold. First, it sought to delineate the intellectual structure of recent climate change management literature. This involved identifying the core themes and dynamic trends that characterize the current state of research in this field. Second, the study aimed to ascertain the primary stakeholders targeted by climate change strategies. By measuring the breadth and depth of firms' sustainability efforts, it endeavoured to pinpoint and understand the key stakeholder groups that are integral to the deployment of climate change strategies.*

Methodology*. This comprehensive analysis scrutinized 495 scholarly articles published in leading business management journals from 1995 to 2023. The study aimed to dissect the intellectual framework underpinning contemporary climate change management research, utilizing the Bibliometrix tool for this purpose. To assess the breadth and depth of firms' sustainability initiatives, a detailed content analysis was performed on the amassed documents, employing the MAXQDA software for rigorous examination.*

Results*. The findings indicated that the United States, Great Britain, and Australia are leading the charge in climate change research. Key milestones in the field were reached in 2012, 2018, and 2023, marking significant progress in understanding and addressing climate change. Currently, the focal points of research are shifting towards sustainable finance and the assessment of carbon risk, reflecting the evolving priorities in addressing climate change challenges. Finally, depth and breadth metrics revealed a nuanced understanding of stakeholder orientation with climate change strategies.*

Research limitations. *The limitations of this study deserve careful consideration for future research. First, the complex nature of climate change as a global challenge transcends disciplinary boundaries, making a purely management-focused approach potentially narrow. Second, the lexicon used to outline climate change strategies is in a state of continuous evolution, and the terminology and concepts that define these* *strategies are likely to expand and change. Finally, while the study used metrics to assess the breadth and depth of companies' sustainability efforts, there is an opportunity to improve this analysis through the development of a standardized index.*

Managerial implications. *Bridging the gap between climate change challenges and managerial strategies, this review equips organizations with a strategic framework to enhance their sustainability efforts in alignment with stakeholder expectations.*

Originality of the paper*. This systematic literature review is pioneering in its comprehensive examination of climate change within the management literature, offering a unique lens through which to evaluate the integration of sustainability into business strategies. By mapping thematic evolution and identifying emerging trends, the review provides new insights into aligning business practices with stakeholder expectations. Moreover, this study represents the first effort to investigate the intricate intersection between climate change and firms' stakeholder orientation, by measuring the breadth and depth of firms' sustainability efforts.*

Key words: *climate change; systematic literature review; stakeholder orientation; sustainability*

1. Introduction

Climate change is the greatest (Rainard *et al.*, 2023) and most urgent (Falk *et al.*, 2024) challenge facing humanity. The term 'climate change' was delineated from former article 1 of the United Nations Framework Convention on Climate Change as *'any change in climate attributed directly or indirectly to human activities, which alters the composition of the atmosphere worldwide and adds to the natural climate variability observed over comparable time periods'* (Bodansky, 1993). The distinction between 'climate variability' and 'climate change' becomes apparent through this definition (Ghil and Lucarini, 2020). Climate variability is the result of natural fluctuations that are unaffected by human activities. In this sense, it is contingent upon temporary and localised natural factors such as shifts in oceanic conditions and solar activity.

Meanwhile, climate change is primarily driven by anthropogenic factors. For instance, one contributing factor is the emission of greenhouse gases from companies. Consequently, it can be characterised as a complex phenomenon owing to the intricate interplay of numerous interconnected variables, each contributing to the overall impact of change.

The global debate on climate change, characterized by increasing droughts, accelerating biodiversity loss, land degradation, and the imminent collapse of food systems, has gained ever more pressing relevance, becoming a central topic in the daily conversations of leaders globally.

In response to the growing need to address the climate issue, significant interest has developed over time from the research community (Moss *et al.*, 2010). This interest has given rise to a series of perspectives through which scholars have explored the topic in depth.

Meyer (1995) explored the economic implications of climate change, providing insights into mitigation benefits, costs, policy choices under uncertainty, and alternate policy response mechanisms that influence climate change policies at domestic and international levels. Renukappa, Akintoye, Egbu, and Goulding (2013) highlighted the importance of integrating climate change and carbon management into business models. Dahlmann, Branicki, and Brammer (2019) explored the role of corporate climate change goals in shaping their emissions trends, distinguishing between symbolic and substantive commitments to reduce environmental impacts. Ponte (2020) discussed how leading companies in value chains address sustainability issues as a key competitive element and source of value creation, suggesting a process of *'green capital accumulation'*. Ghadge, Wurtmann, and Seuring (2020) identified sources, consequences, and control mechanisms of climate change risks in global supply chains. Using the framework of Drucker's Business Theory, Laszlo, Cooperrider, and Fry (2020) argued that global challenges such as pandemics and climate change offer businesses the opportunity to better align with the needs of society. Littlewood, Decelis, Hillenbrand, and Holt (2018) examined the importance of business drivers, sustainability factors, and stakeholder pressure in motivating corporate commitment to climate change action. These studies offer a range of perspectives on how businesses respond to climate change, from managing carbon emissions and risks in supply chains to leveraging global challenges in transformative business models. They provide valuable insights into the evolving landscape of business and management research in the context of climate change, helping to paint a complex and detailed picture.

Considering that a *Systematic Literature Review* (SLR) is vital in academic research because it helps gather current information and analyse the state of the art in that specific issue (Kunisch *et al.*, 2018), the primary objective of this paper was to organise the managerial literature on climate change to comprehend its current state and thematic evolution and suggest directions for future studies.

Second, the integration of climate change into business practices extends beyond the operational aspects of sustainability. Numerous studies (e.g. Vieira, Stewart, Lamberts, and Beal (2020), Shackleton *et al.* (2019), Corfee-Morlot, Cochran, Hallegatte, and Teasdale (2011)) have highlighted the evolving expectations of businesses to not only address climate change proactively but also to engage stakeholders in meaningful dialogue and action. Thus, this study aimed to explore the various dimensions related to climate change, offering a significant contribution to understanding the phenomenon from a new perspective: the stakeholder perspective. In fact, given that companies are committed to addressing environmental challenges due to pressure from stakeholders (Kölbel *et al.*, 2020), we decided to understand which categories of stakeholders the research has focused on when implementing strategies on climate change.

To achieve these ambitious objectives, this study adopted a mixed methods approach, blending qualitative and quantitative methodologies.

To establish a comprehensive framework and offer a panoramic view of how climate change is addressed in the managerial literature, we utilised Bibliometrix, an advanced bibliometric analysis tool (Aria and Cuccurullo, 2017). This platform enabled us to perform precise data collection and analysis by reviewing over 400 articles published between 1995 and 2023. This extensive temporal analysis provides insights into the evolution of managerial literature concerning climate change.

Subsequently, we explored how this perspective intersects with corporate stakeholder orientation through content analysis. In particular, all the papers under observation were questioned by the MAXQDA program to better understand the latent features of each study, namely, the relationship between the climate change call to action and the stakeholders. Then, by inheriting breadth and depth measures from the literature (Vurro and Perrini, 2011), we evaluated the direction of firms' sustainability efforts in response to stakeholder pressure on climate change. Depth measures the average volume of strategies related to climate change and is mentioned in the document with reference to the stakeholder categories recognised in the literature: shareholders, human resources, managers, competitors, customers, providers, institutional investors, non-governmental organisation (NGO), local communities, and the environment. While breadth measures the variety of climate change aspects included in a document, it is also observed through the lens of stakeholder orientation.

In essence, this research bridges the gap between climate change and management, offering organisations a roadmap for navigating the evolving landscape of environmental management.

There is a call to action to address the urgent challenges of climate change and to contribute to a more sustainable future through tailored recommendations for management professionals.

2. Review structure and methodology

The systematic literature review approach is distinguished by its structured, transparent, and replicable procedure (Centobelli *et al.*, 2020). This methodology empowers researchers to meticulously investigate specific research questions and ensure the execution of a robust and methodological research process. The review process was organised into four distinct phases, each contributing to a comprehensive analysis of the existing literature (Fink, 2019):

1. Selection of research questions and methodological approach: In the initial phase, the research questions were meticulously crafted, and suitable bibliographic databases were chosen.
2. Definition of inclusion/exclusion criteria: This phase involved the formulation of rigorous criteria for the inclusion or exclusion of pertinent literature, while maintaining review integrity.
3. Development and implementation of a methodological review protocol: A structured review protocol was created and executed to establish a standardised methodology for a systematic understanding of the phenomenon.
4. Summary of results: The results of this systematic review were succinctly summarised, offering a comprehensive and coherent overview of the findings.

To comprehensively understand the multifaceted nature of climate change and its impact on organisations and stakeholders, we identified the following research questions (RQs) (phase 1).

First, while numerous studies have explored climate change and its risks across various sectors (Ghadge *et al.*, 2020; Ng *et al.*, 2018; Nikolaou *et al.*, 2016) and organizational responses to these changes (e.g., Nema *et al.*, (2012)), a systematic approach to organizing this knowledge, particularly regarding its intellectual structure, remains absent.

Hence, we stated the following research question:

RQ1: What is the intellectual structure of recent climate change management literature?

This study aimed to uncover the foundational elements of climate change management research, emphasising the identification of predominant themes and dynamic trends shaping the field. By synthesising the existing literature, this investigation provides a comprehensive understanding of the key issues and evolving trajectories in climate change management.

Second, in an evolving landscape, it is crucial to understand the key stakeholders to whom climate change strategies are directed. As companies increasingly recognise the critical role of environmental management in their operational and strategic frameworks, identifying and engaging key stakeholders has become a central concern. Sprengel and Busch (2011) provided a fundamental understanding of how stakeholder pressures influence the formulation of environmental strategies, with a particular focus on climate change. Expanding the dynamics between environmental strategies and stakeholder management, Buysse and Verbeke (2003) demonstrated that more proactive environmental strategies are associated with broader and deeper stakeholder coverage. Their empirical analysis indicated that companies with global environmental strategies tend to engage with a broader range of stakeholders, highlighting the importance of inclusiveness in stakeholder management practices. Further complicating the stakeholder landscape, Haigh and Griffiths (2009) argued for recognition of the natural environment as the primary stakeholder in the context of climate change. Research question 2 (RQ2) sought to delve deeper into this critical area by investigating the key stakeholders targeted by companies' climate change strategies:

RQ2: Towards which stakeholders are climate change strategies primarily targeted?

This question investigated the primary stakeholders to whom the climate change strategies were directed. By assessing the breadth and depth of sustainability efforts, this study seeks to identify and understand the primary stakeholders central to the implementation of climate change strategies within firms' organizational frameworks.

The first research question (RQ1) lends itself to a scientific mapping approach that enables visualisation of the structure and interrelationships within the scientific literature of a specific field.

Meanwhile, RQ2 is better suited for investigation through qualitative content analysis. For the scientific mapping analysis, the Bibliometrix tool (Aria and Cuccurullo, 2017; Linnenluecke *et al.*, 2020) was opted, which offers the capability to create visual representations of the research landscape in the chosen field.

To address the qualitative content analysis aspects of RQ2, MAXQDA software is known for its proficiency in analysing and interpreting textual data in a qualitative manner. This approach allowed us to leverage the strengths of both scientific mapping and qualitative content analysis techniques to comprehensively address the research questions and derive valuable insights.

The selection of papers to be investigated for research purposes was based on the following approaches (phase 2) on databases and journals (phase 3).

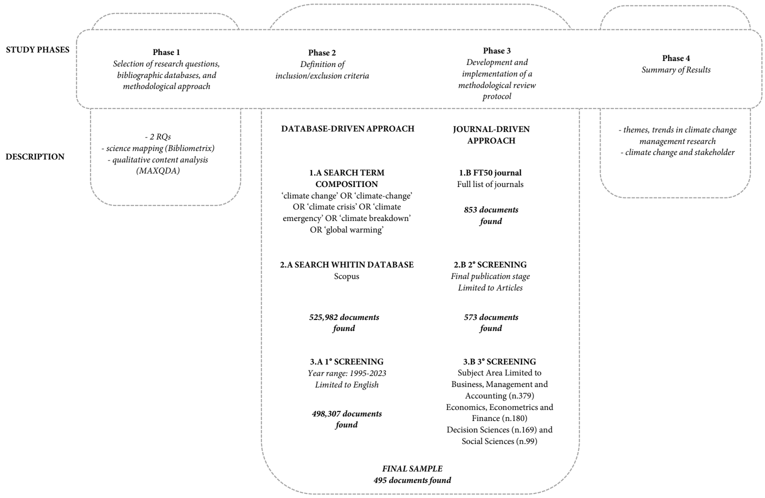
In detail, the database-driven approach was useful to identify:

- search terms criteria: 'climate change' OR 'climate-change' OR 'climate crisis' OR 'climate emergency' OR 'global warming'.
- database sources: Scopus and Ebsco host (Aguinis *et al.*, 2023)
- 1st screening criteria:
  - Timespan: 1995-2023, the authors selected 1995 as the starting point for the analysis because it was the year of the first Conference of the Parties of the UN Framework Convention on Climate Change (UNFCCC), marking the inception of the first international environmental treaty addressing global warming;
  - Language: Only English was used to prevent language bias (Stechemesser and Guenther, 2012).
- the journal-driven approach, which perfected the identification of papers with other selection criteria, such as
- source type: limited to FT50 journal,
- 2nd screening criteria:
  - publication stage: Only final papers were included, excluding articles published in the press.
  - document type: only articles were considered;
- 3rd screening criteria:
  - subject areas: Business, Management and Accounting, Economics, Econometrics and Finance, Decision Sciences and Social Sciences.

Finally, the results were synthesised (Phase 4) in alignment with the formulation and development of the research questions.

The procedure to carry out the review was structured as shown in Figure 1.

Fig. 1: The developed method in this study



Source: our elaboration

3. Results

3.1 The key themes and trends in climate change management research

Analysis of the bibliometric results began with a concise description of the main bibliometric statistics. Subsequently, the investigation delved into contextual performance before scrutinising the primary themes and trends in the field of climate change management. A literature review was conducted on 495 papers published between 1995 and 2023. The articles were written by 1197 authors, of which only 97 were single authors. Table 1 summarises the main information from the collection.

Tab. 1: Main information about the data collection

MAIN INFORMATION	
Timespan	1995-2023
Sources (journals, books, etc)	115
Documents	495
Annual growth rate %	16.5
Document average age	6.01
Average citations per doc	50.09
DOCUMENT CONTENTS	
Keywords plus (ID)	1103
Author's keywords (DE)	1648
AUTHORS	
Authors	1197
Authors of single-authored docs	95
AUTHORS COLLABORATION	
Single-authored docs	97
Co-authors per doc	2.69
International co-authorships %	30.57

Source: our elaboration

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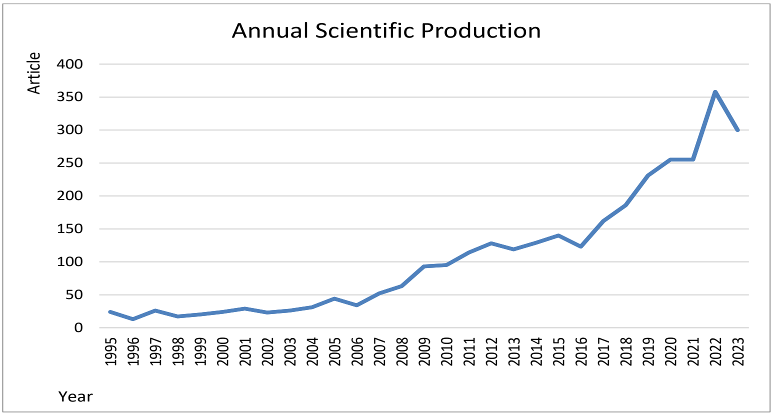
Regarding contextual performance in terms of growth trends related to climate change in management, it was evident that the current relevance of this topic has had a substantial impact on scientific output. There has been exponential growth in scholarly production from 1995 to 2023. The most notable years of increased publication activity were 2012 and 2018, with the highest peak occurring in 2023.

Fig. 2: Annual scientific production



Source: our elaboration

Based on the affiliation information collected from each author in the database, it was possible to identify the regions that contributed to the field from 1995 to 2023. The top 20 of the 59 affiliated countries are listed in Table 2. These countries represent 87% of global scientific production. The top three countries were the USA, with 254 papers published, the UK, with 136 papers, and Australia, with 75 papers.

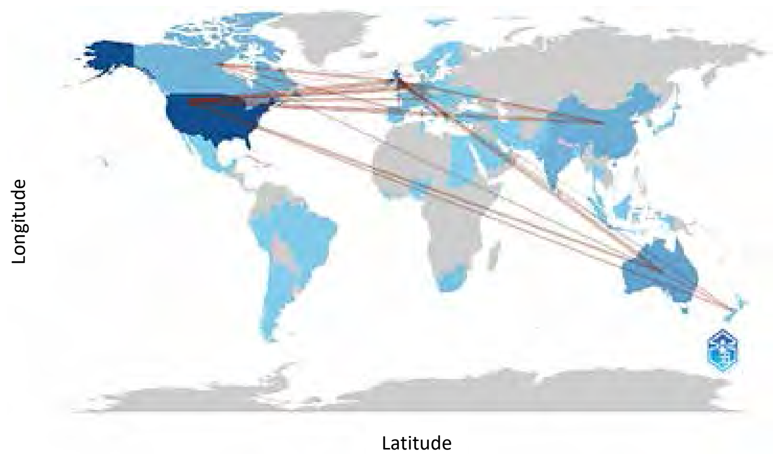
Tab. 2: Number of documents published by country

#	Region	Freq	#	Region	Freq
1	USA	254	11	ITALY	22
2	UK	136	12	SOUTH AFRICA	22
3	AUSTRALIA	75	13	SPAIN	17
4	CHINA	69	14	SOUTH KOREA	15
5	CANADA	46	15	MALAYSIA	14
6	INDIA	45	16	IRELAND	12
7	GERMANY	40	17	BRAZIL	11
8	SWITZERLAND	33	18	NEW ZEALAND	11
9	FRANCE	26	19	BELGIUM	10
10	NETHERLANDS	23	20	FINLAND	10

Source: our elaboration

As the contributions from the USA, UK, and Australia were the highest, theoretically, it was expected that collaboration among researchers in these countries would be the highest. This expectation is confirmed in Figure 3.

Fig. 3: Country collaboration map



Source: our elaboration

Table 3 presents an overview of the most frequently used keywords across the four categories: keywords plus, authors' keywords, words within titles, and words found in abstracts. Keywords plus refer to words or phrases commonly found in the titles of references cited within an article, but not within the article's title. This differentiates them from the authors' keywords, words in titles, and words in abstracts, which are selected by the authors of the respective papers. In bibliometric analysis, Bibliometrix creators regard keyword plus as significant because the authors' keywords are not always explicit enough to convey the core content of an article.

Nevertheless, the keywords selected by the authors also hold value. As expected in an analysis centred on climate change, words such as 'climate change' and 'climate' were prominently featured in all four types of words examined. The concepts of 'management' and 'environmental management' were also recurrent across all dimensions studied.

Interestingly, the most frequently recurring words in each of the four categories were related to sustainability management strategies. Keywords plus, for instance, alluded to the more societal aspect of sustainability, as evidenced by the frequency and intensity of words associated with this aspect, such as 'human', 'humans', 'decision making', 'fame', 'adult', 'male', and 'workplace'. On the other hand, authors' keywords were primarily linked to the environmental facet of sustainability, with terms like 'safety climate', 'adaptation', 'energy efficiency', 'environmental management', 'LCA' (Life Cycle Assessment), and 'circular economy'.

The words used in titles appeared to be more attention-grabbing and were often associated with corporate-level content, thus reflecting the governance of sustainability. Examples included the use of the word 'performance' (absent in the other categories), as well as 'industry', 'corporate', 'company', and 'firm'. Finally, the keywords most frequently adopted by the authors in abstracts seemed to strike a balance among all three dimensions of sustainability.

Tab. 3: Most frequently used keywords

Keywords+	Freq.	Authors' Keywords	Freq.	Titles	Freq.	Abstract	Freq.
climate change	1001	climate change	379	climate	729	climate	5443
article	370	sustainability	139	management	593	management	4171
sustainable development	300	safety climate	94	change	298	study	3240
human	287	sustainable development	84	performance	269	companies	2859
environmental management	286	innovation	73	study	266	change	2548
global warming	223	adaptation	58	carbon	265	environmental	2403
risk assessment	199	corporate social responsibility	58	environmental	258	energy	2002
decision making	198	management	51	safety	249	research	1998
emission control	184	energy efficiency	44	energy	220	results	1915
humans	183	environmental management	44	industry	217	safety	1889
sustainability	179	life cycle assessment	42	corporate	214	firms	1834
environmental impact	175	risk management	40	development	166	performance	1800
carbon dioxide	168	organizational climate	38	analysis	165	carbon	1725
carbon	162	environmental performance	37	sustainable	160	paper	1605
female	152	global warming	37	companies	158	data	1541
China	146	environment	36	green	157	analysis	1352
greenhouse gases	146	carbon footprint	35	risk	156	development	1343
adult	142	knowledge management	35	assessment	153	model	1332
male	142	circular economy	34	organizational	150	emissions	1283
energy efficiency	138	China	32	role	147	water	1273
united states	135	greenhouse gas emissions	32	innovation	144	impact	1215
carbon emission	131	supply chain management	32	supply	144	business	1163
workplace	131	safety culture	31	sustainability	143	company	1161
industry	130	carbon emissions	30	firms	135	organizational	1124
greenhouse gas	126	leadership	29	impact	133	risk	1115

Source: our elaboration

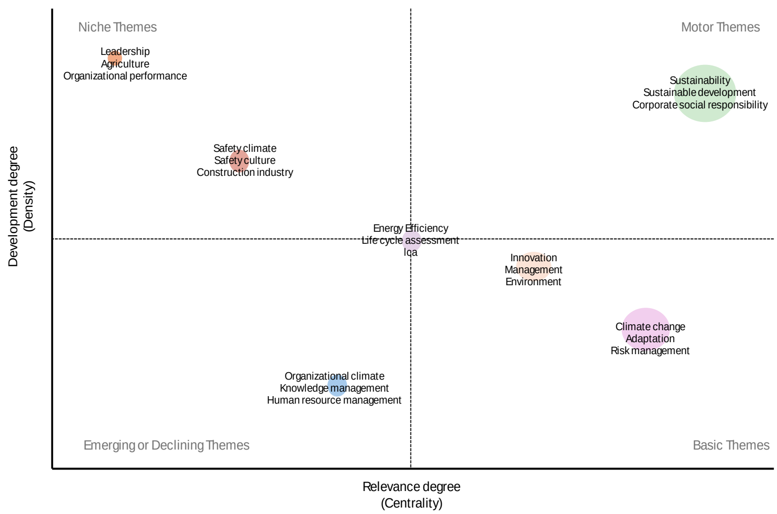
The matrix in Figure 4 presents a thematic map generated from the keywords and papers. This figure is significant to the analysis because it visually represents how the concept of climate change aligns with emerging or waning themes in the field of management.

The matrix revealed the presence of seven distinct theme clusters: safety, organizational, sustainability, energy efficiency, leadership, innovation, and climate change. These themes were subsequently arranged based on two key variables: centrality, which reflects their level of relevance, and density, which signifies their degree of development.

In the upper part of the matrix, on the left side, the highly developed (niches) themes were presented. Here were listed the keywords linked to 'leadership', 'agriculture', and 'organizational performance'. On the right side, 'sustainability', 'sustainable development', and 'corporate social responsibility' were the keywords presented as motor themes. Down on the right side, there were keywords presented as basic themes, namely 'climate change', 'adoption', and 'risk management'. On the bottom left side, emerging or declining themes were displayed: 'organizational climate', 'knowledge management', and 'human resource management'.

Certain keywords were positioned along the left diagonal of the matrix, particularly those associated with safety and innovation themes, albeit with varying degrees of density and centrality. Of particular significance was the theme centred around the terms 'energy efficiency' and 'LCA', which stood out as a highly central focus.

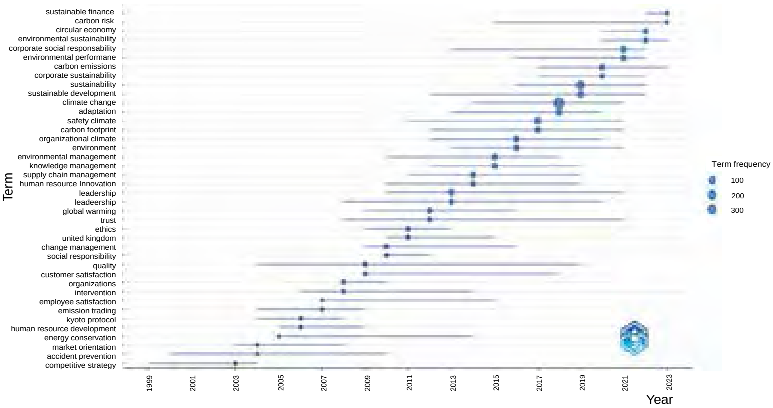
Fig. 4: Thematic map of the keywords plus of the papers



Source: our elaboration

Figure 5 precisely illustrates the temporal evolution of trends in climate change studies. It is evident that the discourse on climate change has shifted over time. Around the turn of the millennium, terms such as 'competitive strategy', 'accident prevention', and 'market orientation' were prevalent. Subsequently, between 2010 and 2015, the terms most frequently used by authors were 'social responsibility', 'change management', and 'leadership'. Subsequently, the trend transitioned to themes related to 'adaptation', 'sustainable development', and 'environmental performance'. Meanwhile, topics of utmost relevance associated with the years 2021-2023 were linked to 'carbon risk' and 'sustainable finance'.

Fig. 5: Keywords trend topic



Source: our elaboration

3.2 The stakeholders and climate change strategies

A methodological framework was meticulously crafted to identify the primary stakeholders targeted by the climate change strategies. The initial steps involved the identification of overarching categories capable of capturing the spectrum of strategies associated with climate change, culminating in the delineation of four macro classes: *mitigation strategies, adaptation strategies, corporate and organizational strategies, and political and regulatory strategies.*

Mitigation strategies are characterised by specific criteria directed at elucidating interventions designed to curtail greenhouse gas emissions and alleviate the impacts of climate change (Cadez *et al.*,2019). Conversely, *adaptation strategies* shed light on measures intended to enhance organisational resilience against current and anticipated impacts of climate change (Ortiz-de-Mandojana and Bansal, 2016). The category of *corporate and organizational strategies* is defined through a comprehensive analysis of the initiatives and internal policies adopted by firms to integrate sustainability and address climate change concerns. Finally, *political and regulatory strategies* involve identifying pertinent government policies, laws, and regulations pertaining to sustainability and climate change.

Following the identification of these macro-classes, specific keywords were meticulously defined for each strategy category, serving as critical indicators during subsequent content analysis. For example, keywords associated with mitigation strategies may encompass terms such as 'carbon reduction' and 'renewable energy'.

A compilation of these keywords formed the basis for developing the vocabulary presented in Table 4.

Furthermore, to enhance methodological rigor, a comprehensive examination of widely cited sources pertaining to climate change was undertaken. Noteworthy websites, such as the Paleontological Research Institution[2], the State of the Climate del National Oceanic and Atmospheric

[2] PRI. the Paleontological Research Institution. https://www.priweb.org/.

Administration[3], the World Bank Group Climate Change Knowledge[4], and the NASA Climate Portal[5], were meticulously reviewed.

At this stage, content analysis was conducted to examine the language, lexicon, and expressions most often used in the literature to connect stakeholders with climate change strategies. The volume of content analysis data is generally large and qualitative data analysis software can simplify the analysis process. In this study, we used MAXQDA 2020 software, which offers valuable data management and analysis support to the researcher (Oliveira *et al.*, 2013).

The software made it possible to query the text content of the research papers and explore the data, as well as analyse the interrelationships between the words in the vocabularies constructed to define climate change strategies and stakeholder categories. Thus, all papers were first coded according to the stakeholder categories identified widely in the literature: shareholders, human resources, managers, competitors, customers, providers, institutional investors, ONG, local communities, and the environment. Individual codifications were then investigated based on vocabularies for climate change strategies. This process allowed us to understand the researchers' orientation in terms of climate change strategies toward all stakeholder categories.

Tab. 4: The vocabulary of climate change strategies

CLIMATE CHANGE STRATEGIES	KEYWORDS
Mitigation Strategies	afforestation, biomass energy, carbon capture, carbon storage, carbon offset, carbon pricing, carbon reduction, clean energy, climate-friendly practices, decarbonisation, emission reduction, energy efficiency, energy conservation, geothermal energy, green building practices, green technology, hydropower, land use, low-carbon, nuclear energy, recycling, reforestation, renewable energy, renewable energy adoption, social innovation, solar energy, solid waste, sustainable agriculture, sustainable transportation, transportation, waste management, wind power
Adaptation Strategies	adaptive agriculture, biodiversity preservation, climate management, climate resilience, climate risk management, climate-informed urban planning, climate-proofing, climate-resilient infrastructure, climate-responsive infrastructure, coastal management, coastal protection, conserve natural systems, crop and livestock diversity for agriculture, disaster preparedness, disaster risk, disaster risk preparedness, disaster risk reduction, disease management, diversify, drought management, ecosystem-based adaptation, flood control, health management, heat resilience, make land use changes, modify management, modify operations, policy changes, relocate, renew natural systems, resilient communities, retreat, water resource management
Corporate and Organisational Strategies	carbon footprint reduction, carbon footprint , circular economy, corporate social responsibility, eco-friendly business, environmental management, environmental management systems, environmental responsibility, green procurement policies, green supply chain, iso, stakeholder engagement, supply chain sustainability, sustainability disclosure, sustainability performance, sustainability practices, sustainability reporting, sustainable operations, sustainable procurement, sustainable product design, sustainable product design sustainable product manufacturing
Policy and Regulatory Strategies	cap-and-trade, carbon market regulations, carbon taxation, clean energy incentives, climate action plans, climate adaptation policies, climate regulations, climate resilience policies, emission reduction, emission reduction regulations, emission reduction targets and regulations, emission targets, energy efficiency regulations, environmental legislation, incentives for renewable energy and energy efficiency, international agreements and treaties, international climate agreements, international treaties, Paris agreement, renewable energy policies

Source: our elaboration

3 NOAA. National Oceanic and Atmospheric Administration - State Climate. https://www.ncdc.noaa.gov/sotc/.

4 https://climateknowledgeportal.worldbank.org/

5 NASA. Global Climate Portal (NASA). https://climate.nasa.gov/evidence/.

Thus, the results obtained from this analysis were used to operationalise the depth and breadth variables (Vurro and Perrini, 2011a). Depth corresponds to the average volume of climate change aspects (keywords) mentioned in the document. It is given by the sum of the climate change aspects related to each stakeholder multiplied by an index that corresponds to the ratio between the total number of aspects cited for the stakeholder in all documents and the total number of climate change aspects cited with respect to all stakeholders. A weighting index was inserted to reduce the subjectivity in the choice of aspects considered in the content analysis.

Breadth corresponds to a variety of aspects related to climate change included in the document. This variable is calculated as the ratio between the total number of climate change aspects found in a single document relating to each stakeholder and the total number of climate change aspects researched in all the documents collected relating to that specific stakeholder.

The two measures, breadth and depth, were calculated for each strategy identified in Table 4, and for each of the previously indicated categories of stakeholders. Table 5 presents the results of this analysis.

Tab. 5: Breadth and depth of sustainability efforts

STRATEGIES	Adaptation		Mitigation		Corporate and Organisational		Policy and Regulatory	
MEASURES	Depth	Breadth	Depth	Breadth	Depth	Breadth	Depth	Breadth
STAKEHOLDERS								
Shareholder	0.08	1.00	1.91	6.86	2.70	8.50		
Human resources	0.03	1.00	1.31	3.55	2.02	5.45		
Manager	0.04	1.00	2.78	3.94	2.95	6.09		
Competitor	0.02	2.00	0.13	1.38	0.26	2.75		
Customer	0.49	1.33	26.73	9.86	17.86	13.18		
Provider			1.01	3.83	0.42	4.75		
Institutional investors	0.34	2.00	11.40	9.07	9.14	10.90		
Ong					0.01	2.50		
Local community	1.63	2.33	22.99	9.00	15.44	13.30		
Environment	6.81	1.86	341.69	27.17	459.08	67.38	8.39	16.00

Source: our elaboration

Table 5 outlines the depth and breadth of climate change strategies across different stakeholder categories, measured through adaptation, mitigation, corporate and organisational strategies, and policy and regulatory strategies.

What clearly emerged was that the environment was the primary focus: the highest depth and breadth scores were consistently observed in the 'environment' stakeholder category across all strategies, especially for mitigation and corporate and organisational strategies. This indicates a significant emphasis on environmental impact within climate change strategies, showcasing firms' focus on reducing their ecological footprint and directly addressing environmental sustainability.

However, there was a notable variability in how different stakeholders engage across strategies.

For instance, 'customers' and 'local community' received substantial attention in mitigation strategies that focused on engaging with external stakeholders directly affected by a firm's operations and climate change policies.

The depth and breadth scores in the corporate and organisational strategies category were high for several stakeholders, including shareholders, human resources, and managers. This suggests that internal stakeholders are crucial to the implementation of climate change strategies within firms, emphasising the role of internal policies and organisational culture in driving sustainability efforts.

Mitigation strategies had the highest depth and breadth scores across most stakeholders, indicating that firms invest heavily in efforts to reduce climate impact. This was especially true for the 'environment' category, where mitigation strategies were most pronounced, highlighting a direct response to climate change through reducing emissions and other environmental impacts.

The policy and regulatory strategies category was notably empty for most stakeholders, except for 'environment', which suggests that while firms are focusing on direct action through mitigation and adaptation, there may be less emphasis on engaging with or influencing policy and regulatory frameworks. The high scores for 'environment' in this category could imply a recognition of the importance of compliance with environmental regulations or a strategic focus on influencing environmental policy.

Finally, an analysis of the depth and breadth measures across various climate change strategies and stakeholders revealed a complex landscape of stakeholder engagement in firms' sustainability efforts. The emphasis on the environment across strategies underscores the prioritisation of direct environmental impacts in climate change initiatives. Meanwhile, the significant scores for internal and external stakeholders in certain strategies highlighted the multifaceted approach firms take to address climate change, incorporating both internal policy changes and external stakeholder engagement. This analysis suggests that successful climate change strategies require a comprehensive approach that considers a broad spectrum of stakeholders and employs various strategies to address the challenges posed by climate change.

4. Discussion and conclusion

This systematic literature review (SLR) represents a groundbreaking effort to systematically consolidate and analyse how climate change is being integrated within the domain of business and management. By adhering to a rigorous, structured, and transparent methodology, this review not only delineates the intellectual landscape of recent climate change management literature but also provides an exhaustive overview of the field's evolution and the intricate ways in which firms engage with climate change through stakeholder orientation.

Our analysis sheds light on a vibrant and expanding corpus of literature that underscores the escalating acknowledgement of climate change as a pivotal concern within the business and management spheres.

The investigation into the intellectual structure of this literature (RQ1) uncovered a diverse array of themes and trends, highlighting the complexity of the field and the multifaceted approaches organisations adopt in response to climate change. Scientific mapping has provided valuable insights into the foundational elements of climate change management research, illuminating the key issues and evolving trajectories that have shaped this critical area of study. However, the implications of the findings vary. For one, they suggest that the business and management research community is increasingly treating climate change not merely as an environmental or peripheral issue but as a central strategic concern (Ghadge *et al.*, 2020; Moshood *et al.*, 2021). Moreover, the various themes and trends identified through our SLR signal a growing consensus on the necessity of innovative, multi-stakeholder approaches to climate change strategies. These strategies aim to minimise the negative impacts and leverage opportunities for sustainable growth and competitive advantage.

Furthermore, this review highlighted the importance of an interdisciplinary approach (Schipper *et al.*, 2021) to researching climate change within the business and management context. The intricate interplay between climate change challenges and business strategies calls for a collaborative effort spanning various disciplines, including environmental science, sociology, economics, and organisational behaviour, to name a few.

In addressing the second research question (RQ2), our analysis identified the primary stakeholders targeted by climate change strategies, emphasising the significance of a broad and deep engagement with sustainability efforts. This focus underscores the vital role that stakeholders play in driving firms towards more sustainable practices, reflecting a growing awareness of the need for a collaborative approach to address the multifarious challenges posed by climate change.

The use of advanced analytical tools, such as Bibliometrix for scientific mapping and MAXQDA for content analysis, has enabled rigorous examination of the literature, facilitating a nuanced understanding of the research landscape. This approach not only enhances the robustness of our findings but also contributes to the development of a strategic compass for future research and practice in the field.

A holistic review of 495 papers from top journals published between 1995 and 2023 provided a strategic compass for navigating the evolution of climate change themes within the business and management domains.

As the first to systematically investigate the intersection between climate change and a firm's stakeholder orientation, the SLR serves as a foundational resource for scholars and practitioners. This calls for a continued and deepened focus on sustainability efforts and urges firms to adopt a proactive and inclusive approach to stakeholder engagement in the face of climate change. In conclusion, this SLR not only maps the current state of climate change research within the business and management field but also sets the stage for future investigations. This highlights the need for ongoing research to adapt and evolve in response to the changing dynamics of climate change, urging a more nuanced and comprehensive approach to understanding and addressing the implications for firms and their stakeholders. As the field continues to grow and evolve, this study represents a critical step forward in integrating climate change considerations into business and management practices (Loureiro *et al.*, 2020).

4.1 Recommendation

These findings underscore the increasing recognition of climate change as a pivotal issue in the business and management communities, with a diverse range of themes and trends emerging from the literature. The analysis identified key stakeholders in climate change strategies and emphasised the importance of broad and deep engagement with sustainability efforts. However, the results showed that there is still scope for interventions for researchers.

The findings of the first research question reveal a varied landscape of climate change research in management, highlighting themes such as sustainability, energy efficiency, and leadership as central and well-developed. Emerging themes such as knowledge and human resource management suggest a broadening of the research focus. This diversity indicates a shift towards integrating climate change into broader management practices, underscoring the importance of multidisciplinary approaches for addressing sustainability challenges.

Given the temporal evolution of climate change studies, researchers could focus on further exploring sustainable finance and carbon risk management, emphasising the integration of climate considerations into corporate strategies and financial decision-making.

What emerges from the second research question is that the use of depth and breadth metrics allows for a nuanced understanding of stakeholder engagement. Depth, reflecting the volume of climate change aspects mentioned, and breadth, indicating the variety of aspects, together suggest that firms not only cover a wide range of topics related to stakeholders but also emphasise these topics to varying degrees. Future research should explore the dynamics between climate change strategies and a broader range of stakeholders, particularly focusing on under-researched groups, such as non-governmental organizations and the financial sector, to understand their influence on corporate sustainability efforts.

Moreover, policy and regulatory frameworks are underdeveloped; thus, it is important to examine the impact of evolving policy and regulatory landscapes on corporate climate change strategies, especially in different geographical contexts and industries. This examination sheds light on how external pressures influence corporate actions.

The following table briefly summarises the main recommendation of this study.

Tab. 6: Recommendation

Aspect	Trend	Future RQs	Practitioner Implications
Strategy	Integration of climate considerations	How can sustainable finance and carbon risk management be further integrated into corporate strategies and financial decision-making?	Firms need to embed climate change considerations into their core strategies, utilising sustainable finance and assessing carbon risks.
Stakeholder	Broad and deep engagement	How can firms enhance engagement with under-researched stakeholders like NGOs and the financial sector to influence corporate sustainability efforts?	Businesses should expand their stakeholder engagement efforts to include a wider array of stakeholders, focusing on deep and meaningful collaborations.
Mitigation Strategies	Energy efficiency, sustainability	How can organisations further develop and implement energy-efficient and sustainable practices in their operations?	Companies should prioritise energy efficiency and sustainability in their operations to mitigate their impact on climate change.
Adaptation Strategies	Developing resilience to climate impacts	What strategies can firms adopt to enhance their resilience against the adverse effects of climate change?	Organisations need to adopt and innovate adaptation strategies to safeguard their operations and supply chains against climate-related disruptions.
Corporate and Organisational Strategies	Leadership in climate initiatives	How can leadership and knowledge management be leveraged to foster a culture of sustainability within organisations?	Leadership must actively promote a culture of sustainability and innovation, integrating climate change into organisational practices and decision-making.
Policy and Regulatory Strategies	Navigating evolving landscapes	How do changing policy and regulatory landscapes impact corporate climate change strategies, especially across different geographical contexts and industries?	Firms must stay informed about and adapt to evolving policy and regulatory frameworks, ensuring compliance and leveraging these changes for strategic advantage.

Source: our elaboration

In essence, this SLR not only charts the current state of climate change research within the business and management field but also catalyses future investigations into this critical area. It advocates for a nuanced and comprehensive approach to understanding and addressing the implications of climate change for firms and their stakeholders. By emphasising the need for ongoing research and the development of flexible strategies, this review highlights the critical importance of businesses staying agile and responsive to the ever-evolving environmental challenges. Moreover, it calls for an interdisciplinary approach, incorporating insights from finance, policy studies, human resources, and technology to foster a more robust and resilient business model that can withstand and adapt to the uncertainties presented by climate change.

This SLR emphasises the transformative shift in how businesses view their role in addressing climate change, advocating for a proactive stance that not only mitigates risks but also seizes opportunities for innovation in sustainability.

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Activism across borders: strategic brand approaches for multinational enterprises in Europe[1]

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Abstract

Frame of the research. *As multinational enterprises (MNEs) increasingly engage in roles beyond conventional business activities, their involvement in brand activism has become a focal point of interest. This development underlines the urgency for MNEs to address global challenges, positioning them as pivotal actors in the evolving corporate social responsibility and global activism narrative. In particular, the heterogeneous socio-political context of Europe, featuring varied levels of press freedom, regulatory frameworks, and cultural norms, presents a compelling case to explore the tension between local adaptation and global standardization in activist communications.*

Purpose of the paper. *This research explores the unexplored realm of brand activism from an international perspective, focusing on how MNEs either standardize or customize their activist communications to align with the diverse contexts within specific European markets. The primary purpose is to analyze MNEs' strategies to ensure that their activism effectively resonates across various European landscapes while assessing the balance between regional consistency and local relevance in their messaging. Furthermore, we examine how different degrees of press freedom can either amplify activist messaging or expose brands to heightened scrutiny. Additionally, the study considers the role of press freedom in shaping activist communications within these contexts.*

Methodology. *To address this purpose, the research is divided into two studies employing a mixed-method approach to achieve this goal. Study 1 conducts a content analysis of social media communication from an activist brand across several European countries. Study 2 performs a semiotic analysis to understand whether the communication is adapted or standardized to different local contexts. Considering the study's purpose, an activist brand in multiple countries was selected for the analysis as the research setting.*

Results. *This multicounty case study reveals how an MNE conducts brand activism across various European countries, adapting its communication by showing significant variation in activist commitment levels across these markets. The analysis highlights the MNE's strategic adjustments to resonate with diverse regional audiences, indicating a tailored approach to brand activism within the European context. Furthermore, the study examines how press freedom influences these variations in commitment and communication.*

Research limitations. *The research offers valuable insights but is limited by focusing on a single MNE and using only Instagram for data analysis, concentrating solely on communication rather than exploring the MNE's practical actions. To enhance understanding, future studies could broaden their scope by incorporating a wider range of MNEs operating within different European countries, examining brand activism across diverse digital platforms, and delving into the tangible actions that accompany such activism. Moreover, investigating how evolving technologies like AI-driven sentiment analysis could shape or refine international activism strategies will provide a more nuanced outlook on global brand activism. Additionally, future studies should examine brand activism from a global perspective, not limited to Europe, by including countries with more challenging levels of democracy.*

Managerial implications. *This study offers relevant insights for MNEs who navigate the realm of brand activism within European markets. It underscores the critical need for thoughtful decision-making when choosing between standardizing or adapting activist communications. In particular, adopting universal environmental campaigns may safeguard global coherence, but addressing sensitive socio-political issues (e.g., LGBTQIA+ rights, migration) often demands local tailoring to respect cultural and moral norms. These strategic considerations are vital not only for effectively engaging with diverse regional audiences but also for overcoming geographical and cultural barriers and enhancing legitimacy within their operational environments, particularly considering varying levels of press freedom across countries.*

Originality of the paper. *Although brand activism has attracted increasing scholarly and managerial attention, his research seems to be the first to explore brand activism within the European context by analysing how MNEs communicate their activism across diverse European countries. By linking the brand activism literature with international business frameworks and the concept of press freedom, this sets the stage for future research to delve deeper into how such activism is conceptualized and executed across different countries, considering varying levels of press freedom.*

Key words: *International brand activism; multinational enterprises; adaptation; standardization; brand communication; semiotic analysis; topic modeling.*

1. Introduction

In today's European marketplace, multinational enterprises (MNEs) are increasingly leveraging brand activism as a strategic approach to differentiate themselves and address social issues across various countries and cultural contexts. This strategy has not only transformed the role of businesses in society but also positioned them as pivotal political actors on the international stage (Podnar and Golob, 2024; Ocelík *et al.*, 2023; Moorman, 2020). Recent instances of brand activism include Microsoft and McDonald's in 2022, both taking a stand against the Ukraine-Russia conflict. In 2023, Stella McCartney voiced opposition to women's violence; Gucci stood against domestic violence; Versace supported the LGBTQIA+ community; and Starbucks expressed solidarity with Palestine. These examples showcase the varied approaches through which brands actively participate in social and political issues, reflecting an increasing inclination of MNEs towards activism. However, the debate on the dual role of MNEs as significant contributors to global issues and potential solutions architects (Zucchella *et al.*, 2023; Kolk *et al.*, 2010) is ongoing. Brand activism adds complexity to this topic, both by raising questions about the democratic legitimacy of the phenomenon and by subjecting the authenticity of these actions to scrutiny. This is particularly true in diverse European regulatory environments, where companies face different legal and cultural entry barriers, and where varying degrees of press freedom may either intensify public scrutiny or limit the impact of activist messaging (Reporters Without Borders, 2023).

Recent studies have begun to uncover how consumers respond to brand activism across different geopolitical contexts. Livas *et al.* (2023) analyzed consumer sentiment towards activist brands in two countries, revealing variations in public reception. Similarly, Hydock, Paharia, and Blair (2020) along with Mukherjee and Althuizen (2020) conducted experiments to assess the impact of brand activism on consumers in a wide range of countries, including the United States (US), United Kingdom (UK), and France (Verlegh, 2024).

In the brand activism field, only Livas *et al.* (2023) analyzed the issue of communication standardization and adaptation, focusing on Greece and the UK from a consumer perspective. This dilemma may be particularly critical in contexts such as Europe, which consists of highly heterogeneous countries (Barnard and De Vries, 2019), facing significant challenges (e.g., nearby geopolitical conflicts, immigration, declining birth rates), and witnessing in recent years the rise of populist governments and difficulties in press freedom (Wannow *et al.*, 2024).

Considering MNEs inherent limitations and challenges, especially in the European context, it is crucial to understand *whether* and *how* companies perform their activist communication in different countries. This represents a significant gap in the current brand activism literature (Saracevic and Schlegelmilch, 2024). Moreover, questions persist about how heightened scrutiny in open media environments might expose brands to reputational damage if accusations of "performative activism" arise, whereas more restrictive press environments might dampen the brand's reach or even lead to censorship. Therefore, to address the dilemma of standardization or adaptation, the present study focuses on MNEs operating within the European context.

The following research questions guided this study:

RQ1: What is the extent of brands' commitment to activist communication in European countries?

RQ2: How do brands adapt or standardize activist communication across different European markets?

Beyond these specific questions, we also ask: "How can MNEs ensure that their activist stance aligns with global brand identity while authentically addressing diverse local socio-political realities?" This study represents a pioneering effort to analyze brand activism from a European perspective, aiming to guide MNEs in addressing grand challenges while pursuing their business objectives. The present research makes relevant theoretical contributions and provides business insights on multiple fronts. Firstly, it lays the foundation for a new avenue of inquiry within brand activism from an international perspective. Secondly, it sheds light on how MNEs can effectively respond to escalating social expectations by adopting an activist strategy to enhance appreciation and acceptance in foreign European markets. Thirdly, the study delves into the adaptation or standardization of activist strategies across diverse markets, particularly from a communication standpoint, offering intriguing insights. Lastly, the research highlights the varying intensity of activism in European countries, recognizing the additional complexities posed by social, political, and cultural factors and the implications of different levels of press freedom.

2. Literature review

2.1 The New Role of Multinational Enterprises in International Business Research

The emergence of MNEs as pivotal actors in addressing grand challenges carries significant implications for international business research (Ghauri *et al.*, 2021). Operating as global entities across diverse socio-political contexts, MNEs are increasingly acknowledged not only as economic entities but also as socio-political actors capable of influencing and being influenced by the grand challenges confronting societies worldwide (Kolk *et al.*, 2010; Ocelìk *et al.*, 2023). These challenges, such as climate change, poverty, or geopolitical conflicts, transcend national borders, making them inherently multinational and necessitating a coordinated response that MNEs are uniquely positioned to provide (Bucley *et al.*, 2017). Engaging MNEs with grand challenges demands a reassessment of their roles and strategies. How MNEs create value, design cross-border operations, manage local employees, and formulate international strategies should now consider the complexity of these global issues. MNEs must navigate the complexities of local policies and institutional environments related to Sustainable Development Goals (SDGs), adapting to multiple regulations, societal values, and stakeholder pressures. Operating within diverse environments presents challenges and opportunities, requiring MNEs to acquire new knowledge, establish local legitimacy, and access critical resources specific to each SDG (Van Zanten and Van Tulder, 2018). This means that MNEs should reconcile the need for a unified global approach to sustainability with the necessity of local adaptation. The transfer of socially responsible practices to subsidiaries is often complicated by differences in institutional contexts, creating a landscape where MNEs must be both globally coordinated and locally nuanced in their operations.

Thus, MNEs are at the intersection of economic, social, and political agendas, where their business activities are inherently linked to broader sustainability goals. The political dimensions of MNE activities further extend to their direct interactions with governments and other political entities (Ghauri *et al.*, 2021). In fact, MNEs can be agents of change, influencing policies through lobbying and alliances or, conversely, reacting to government regulations and initiatives.

From this perspective, digital platforms offer MNEs unprecedented opportunities to communicate their commitment to addressing grand challenges, engage with diverse stakeholders, and advocate for change (Nambisan, 2019). These platforms enable MNEs to narrate their sustainability journeys, showcase achievements, and discuss challenges, fostering transparent dialogue with a global community of informed and engaged employees, customers, and other stakeholders. By effectively leveraging digital communication, MNEs can strengthen their positions in foreign markets and address their significant global challenges. This technological shift presents vast opportunities for companies to implement marketing strategies that align with social and economic goals, contributing to collective social efforts.

2.2 Brand Activism to Address Grand Socio-Political Challenges

Brand activism is a relatively novel marketing strategy that has rapidly garnered significant interest among scholars and brand managers, fundamentally changing the role of businesses in society (Podnar and Golob, 2024; Schmidt *et al.*, 2022), aimed to address both societal good and corporate interest. Stemming from the concept of corporate social responsibility, it evolves into a much stronger, complex, and impactful direction (Sarkar and Kotler, 2020), being defined as a purpose-driven strategy (Rohmanue and Jacobi, 2024) and an intersection between marketing and politics (Jung and Mittal, 2020).

Activist brands take public stances in support of or against controversial socio-political issues through statements and/or actions (Bhagwat *et al.*, 2020; Moorman, 2020). The goal is to generate social change by firstly encouraging prosocial intentions, attitudes, and behaviors among individuals on these issues and, secondly, exerting pressure on institutions and policymakers to address these issues at a macro level (Eilert and Nappier Cherup, 2020; Den Hond and Bakker, 2007).

The activist strategy targets different stakeholders such as consumers, employees, investors, policymakers (Cammarota *et al.*, 2024), suppliers (Kapitan *et al.*, 2022), and other businesses. It should incorporate a comprehensive view of the supply chain (Kapitan *et al.*, 2022), addressing internal and external targets (Cavdar Aksoy *et al.*, 2023), and focusing on both the domestic and international markets. Activist actions find their fullest expression in the domestic market, but they are inherently linked to global issues and primarily operate in alignment with these.

The activist strategy has been born in response to an increasingly strong social demand from stakeholders, urging businesses to contribute beyond mere philanthropy and become true catalysts for societal well-being (Verlegh, 2024; Chu *et al.*, 2023). Furthermore, this increasingly public role of businesses in addressing the global socio-political challenges of our time is also linked to a growing negative perception of institutions and governments (Weber *et al.*, 2023). From this perspective, consumers appear to have lost trust in institutions, stating that these actors cannot tackle significant challenges or are simply disinterested (Radanielina Hita and Grégoire, 2023). Consequently, in an increasingly vulnerable and polarized society, with often inadequate and unprepared political leadership, businesses have quickly filled a void. Activist brands make their voices heard on these issues, expressing strong opinions, seeking support, issuing calls to action, participating in street protests with social movements or non-governmental organizations (NGOs), and engaging in and promoting social initiatives (Lee *et al.*, 2024; Cammarota *et al.*, 2023).

However, although activism originates from the CSR construct, it distinctly differs in several aspects. First, CSR is confined to "doing well by doing good" (Varadarajan and Menon, 1988), aiming to take positive actions for society; in contrast, activism seeks to exert pressure, draw attention to a social issue, effect societal change, and modify individual and collective behaviors (Eilert and Nappier Cherup, 2020). Advocacy, in fact, is one of its defining elements, without which brand activism would lack purpose (Bhagwat *et al.*, 2020). Second, CSR addresses less controversial issues where public opinion agrees (Mukherjee and Althuizen, 2020); activism, by its nature, requires taking a stance on contentious and complex topics (Ahmad *et al.*, 2024), where public opinion is fragmented and in disagreement (Vredenburg *et al.*, 2020). Moreover, brand activism often intersects with current socio-political debates that can amplify reputational risks if the public perceives the action as mere marketing or "woke washing." For example, issues such as abortion, LGBTQ + marriages, major wars, modern slavery, sexual freedom, climate change, gun control, or police violence - topics that are controversial and complex. Third, CSR is usually not a risky strategy; it is a well-accepted and normalized action (Aboelenien and Nguyen, 2024), almost always eliciting positive responses from stakeholders, particularly consumers. In contrast, activism is an extremely risky strategy as it still generates negative, polarized, and unpredictable responses (Guha and Korschun, 2024; Bulmer *et al.*, 2024). These negative reactions can lead to significant boycotts against brands, causing substantial reputational damage and financial losses (Pasirayi *et al.*, 2023; Hydock *et al.*, 2020). The recent case of Bud Light (2023) serves as an illustrative example of brand activism's risk by signaling that it must be implemented and managed with extreme caution. Moreover, anti-brand actions against activist brands are intensified by social media, sometimes even sparking firestorms against the brand (Muraro *et al.*, 2023; Pöyry and Laaksonen, 2022).

From this perspective, another distinguishing element is publicity; activism is a strategy that would make no sense without the communicative aspect (Bhagwat *et al.*, 2020). By its nature, activism is an inherently public strategy that must be communicated through social media, mass media, public relations, events, or other visible means (Korschun, 2021). All of this accentuates both the risks and opportunities of the activist strategy.

Notwithstanding its complex outcomes and implementation modalities, brand activism's potential to truly contribute to society is evident. Additionally, it is a strategy that can enhance or establish a stronger relationship with consumers or other stakeholders. It allows for premium positioning or repositioning in the market (Schmidt *et al.*, 2022), enabling companies to be seen as experts in socio-political issues. This strategy opens the doors to engaging in the socio-political debates about the big challenges of our times and enables companies to enter a new market or strengthen their position in an existing market.

However, until around 2010, companies have typically sought to avoid entering the socio-political sphere and taking positions on controversial issues (Pimentel *et al.*, 2024). This action was considered too risky and polarizing, leading them to prefer ignoring non-business issues (Podnar and Golob, 2024) and maintaining neutrality to avoid getting entangled in sticky and complicated situations (Cammarota *et al.*, 2023).

In today's society, companies should account for another critical element, namely, neutrality is no longer a viable option. Choosing to remain silent on significant socio-political issues is increasingly perceived as a decision, often carrying greater risks and negative repercussions than a clear stance. Neutrality has transformed into a position, but it is frequently criticized by consumers, who now expect companies to use their influence and visibility to address the pressing challenges facing nations worldwide.

2.3 Local Press Freedom as a Political Barrier

Press freedom is pivotal in shaping brand activism across European markets, influencing how messages are communicated and received. Press freedom is defined as the autonomy of the media from political interference or censorship (Van Belle, 2000). According to the World Press Freedom Index (2023), there are significant disparities in European media environments. Greece, for instance, ranks 88th, indicating a restrictive environment, while Sweden (3rd) and Spain (30st) have more open media landscapes (Reporters Without Borders, 2023). Such variations in media openness shape the ability of brands to effectively deliver activist messages, with higher press freedom generally allowing for more transparent and impactful communications.

In this regard, Stetka (2012) emphasizes that media ownership in some Southern and Eastern European countries is often concentrated among business elites with political ties, creating an environment where journalistic autonomy is limited. This concentration leads to restrictions on media freedom and reduced diversity in public discourse. The term highlights the intertwining of media, politics, and business interests, which creates additional challenges for brands engaging in activism. In these contexts, activist messages may face censorship, biased reporting, or limited distribution due to the vested interests of media owners. Additionally, Kenny (2019) argued how populist governments often seek to control media narratives, leading to further erosion of press freedom. This erosion, particularly in environments where governments view independent media as a threat, limits brands' avenues for openly communicating their activism. In such situations, brands often turn to digital media as alternative platforms to bypass restrictions and connect with audiences. However, the success of these digital strategies also depends on the degree of digital media freedom and public access to independent sources (Li *et al.*, 2021). Thus, for MNEs' communication strategies, their activism should be tailored to local media conditions and the specific challenges posed by different levels of press freedom. Balancing advocacy with an understanding of local media dynamics is crucial for engaging stakeholders and effectively communicating their stance on social issues. It also introduces a paradox: while high press freedom may enable more extensive brand activism, it opens brands up to intensive scrutiny and potential backlash if the authenticity of their activism is questioned.

2.4 Balancing Adaptation and Standardization: The Dilemma for MNEs

The activist strategy may foster MNEs to increase and mitigate the "liability of foreignness" a key issue for companies operating abroad, by establishing legitimacy within host countries (Del Bosco and Misani, 2016; Resciniti and Matarazzo, 2012). As corporations expand internationally, they face growing expectations to adopt sustainable practices that align with their target markets' environmental and social needs (Kawai *et al.*, 2018). A central aspect of international strategy is deciding whether to standardize or adapt brand activism communication and initiatives. This decision may be influenced by social, political, cultural, and economic elements - known as distance dimensions (Kraus *et al.*, 2015) - and is particularly important when addressing controversial socio-political issues.

One crucial factor in this adaptation-standardization dilemma is press freedom, which varies significantly across countries and can directly affect the visibility and reception of a brand's activist message. For instance, in markets with higher press freedom, such as Sweden, brands may have more flexibility to communicate openly and gain media attention. Instead, in environments with restricted press freedom, like Greece, brand messages may be more tightly controlled or face reporting bias (Li *et al.*, 2021). Brands should assess how these media conditions shape their potential to advocate for social causes effectively and how to balance transparency with potential risks. When deciding between adaptation and standardization, MNEs should consider whether their activist messaging aligns with each country's unique cultural, legal, and political contexts (Pimental *et al.*, 2024). Adaptation allows brands to tailor their activism to local nuances, which may enhance the effectiveness and acceptance of their efforts. This approach is particularly beneficial in countries where sensitive issues like political control, religious norms, or censorship significantly shape public discourse. On the other hand, standardization emphasizes a consistent approach across markets, focusing on brand coherence and simplicity (Resciniti and Fortuna, 2012). However, this uniformity can be challenging in diverse environments where activist topics are perceived differently. For instance, while issues such as sexism, LGBTQIA + rights, and economic inequality are viewed as "woke" topics in some contexts (Rhodes, 2022), other markets may see them through the lens of local socio-political or religious norms, making a standardized approach less effective. The degree of press freedom further complicates this choice, as it can amplify or constrain brand messaging.

Moreover, authentic brand activism often relies on strong and sometimes provocative communication to engage audiences and drive social change (Cammarota *et al.*, 2023). While an incisive tone of voice may be effective in certain markets (Verlegh, 2024), MNEs should remain mindful of how their messaging will be received across different international contexts, considering cultural differences and media landscapes. Any mismatch might provoke accusations of "performative allyship," harming both brand credibility and long-term stakeholder relationships. Therefore, the choice between adaptation and standardization carries significant implications, as brand activism inherently involves risk (Bhagwat *et al.*, 2020). When executed effectively, brand activism can serve as a "winning formula" for MNEs, allowing them to establish a foothold in foreign markets while addressing social good.

In this regard, MNEs should understand local attitudes and opinions toward socio-political issues to successfully pursue brand activism internationally. They should also assess the opportunities and challenges of varying levels of press freedom and media dynamics. Finally, the strategic decision to adapt or standardize brand activism messaging should align with the company's reputation, goals, and current marketing best practices.

However, according to Saracevic and Schlegelmilch (2024), while the current literature focuses primarily on domestic market impact and corporate outcomes, there is a notable gap in understanding the global implications of brand activism across different media and political environments.

3. Methodology

Based on the study's objectives, we employed a single-case study method, which is well-suited for examining specific, unique, remarkable, or revealing cases to develop or advance relevant theory (Yin, 2017). This approach facilitates an in-depth understanding of the phenomenon under investigation (Zarestky, 2023; Ninci *et al.*, 2020), which is particularly valuable when exploring new corporate phenomena (Yin, 2017), such as brand activism from an international perspective.

We selected Ben and Jerry's as our research setting primarily because it is globally recognized as an activist brand, making it an "information-rich" case (Siggelkow, 2007) that can illustrate broader patterns. In addition, while Ben and Jerry's is indeed known for its explicit and historical commitments to social causes, potentially making it more activist than other brands, this distinctiveness allows us to capture the complexity and operational details of multi-country activism.

Given its global recognition as an activist brand, we chose Ben and Jerry's as research setting. Ben and Jerry's is well-known as an activist leader (Cammarota *et al.*, 2024) and performs activist communication in several countries. The brand recruits its activist managers from diverse backgrounds such as NGOs, global development, and other humanistic fields, bring a wealth of experience and a deep understanding of local and global social issues. Their expertise should ensure that the brand's activism aligns with local regulations, cultural sensitivities, and social norms, significantly enhancing its efforts' effectiveness and local relevance. We analyzed Ben and Jerry's activist communication on social media platforms, providing marketers with unique insights through web data scraping and analysis (Marino *et al.*, 2020). Moreover, the single-case study approach allows for an in-depth exploration of complex phenomena that might be oversimplified through broader approaches (Siggelkow, 2007). Since its inception, Ben and Jerry's has uniquely addressed various social causes with a consistent commitment that stands out in the corporate world. This consistency allows us to maintain "the brand itself" as a constant variable, enabling a more focused and comprehensive analysis of the intensity and nature of activism across different causes and national contexts. By isolating these variables, our study avoids potential interferences from factors that might affect the purity of the analysis, thus providing a clearer picture of how brand activism can differ by cause and region. Ben and Jerry's global presence, with several country-specific social media profiles, presents a unique opportunity to analyze how messages are tailored to diverse cultural contexts. This aspect of the brand's communication strategy is critical for understanding how MNEs manage the complexity of global brand activism while addressing local sensitivities.

As a result, our methodology features two complementary components, a text network analysis (Study 1) to quantify the extent of brand activism and a semiotic analysis (Study 2) to delve into the communicative nuances. By integrating the findings from these two approaches, we aimed to achieve triangulation (Yin, 2017), cross-validating quantitative insights with the deeper interpretive perspective gained from semiotics.

3.1 Brand's Country Profiles Selection

In addition to the thoughtful selection of the activist brand as the research setting for understanding our study's objectives, we also carefully evaluated which geographical region to focus on for this initial exploration of brand activism from an international perspective. Following this, based on the World Press Freedom Index (2023), we carefully selected the specific countries within the region to be included in our analysis.

Europe was chosen as the research setting for this study for diverse reasons. First, it is an area with highly heterogeneous countries from a social, cultural, and economic perspective (Barnard and De Vries, 2019). This diversity allows for comparative analyses, identifying countries that are similar at a macro level but exhibit significant social differences from a micro view. Second, in recent years, Europe has witnessed the rise of populist governments (Wannow *et al.*, 2024) and reduced freedom of speech and information (Siim *et al.*, 2019). Third, Europe has faced significant challenges for years, such as immigration, climate change, and geopolitical conflicts. Fourth, governments frequently attempt to counter social and environmental activism (Mireanu, 2014). Fifth, ongoing conflicts that the global community is closely monitoring, such as those between Russia and Ukraine and Israel and Palestine (D'Arco *et al.*, 2023), are geographically close to European countries, making them acutely felt within this issue. Additionally, in this regard, Europe has historically been the battleground for major world wars fought on its soil. Finally, Europe is often referred to as a "mirror" of the United States, meaning that trends, movements, ideas, or crises that originate in the U.S. (Halperin, 2018; Moro, 2011) frequently manifest shortly thereafter in Europe. This is also true for brand activism, which originated and developed in the U.S. with deep roots (Cammarota *et al.*, 2023), but in recent years, it has become a widely practised, criticized, and debated phenomenon in Europe.

Therefore, Europe's diverse socio-political landscape makes it an ideal setting for exploring how brand activism varies across different countries. Specifically, to capture this diversity, we focused our analysis on three of Ben and Jerry's country-specific profiles, selecting them based on two main criteria: the level of press freedom in each country and the current volume of posts on the brand's Instagram profile. These criteria ensured a varied representation of European environments while providing enough content to examine the brand's communication strategies over time. Given the heterogeneity of press freedom rankings, we selected countries representing different extremes and a middle ground. Precisely, *Sweden*, ranked third in press freedom, was chosen to represent a highly open media landscape, as other top-ranking countries lacked active Ben and Jerry's profiles. *Spain*, ranked 30, was selected as a mid-tier country, providing a more balanced perspective on press openness. Lastly, *Greece*, ranked 88th, represents the lower end of the European press freedom spectrum. This selection enables us to examine how Ben and Jerry's tailors its activism strategies in countries with different levels of media freedom and distinct socio-political contexts.

3.2 Study 1

Study 1 explores the extent of activist communication on Ben and Jerry's Instagram profiles in Sweden, Spain, and Greece. Through a text network analysis of activist posts, the study seeks to reveal the brand's level of commitment to activism within various European contexts, as well as the degree of dedication to each specific issue to address the *RQ1. What is the extent of brands' commitment to activist communication in European countries?*

3.2.1 Data Collection

Instagram was selected as the focal social media platform due to its strong emphasis on visual and textual storytelling, making it an ideal site for analyzing brand communication (Berger and Milkman, 2020). The data collection covered the period from 2016 to 2024, offering a longitudinal view of the brand's communication strategies across different socio-political environments.

Using Apify, a web scraping tool that allows for automated data collection from Instagram's public profiles (Cammarota *et al.*, 2024), we extracted all public posts from the official Ben and Jerry's Instagram accounts in Sweden, Spain, and Greece. This comprehensive dataset was compiled over several sessions to ensure data completeness and was further checked for missing data or discrepancies in order to verify its robustness and reliability (Boegershausen *et al.*, 2022). The collected posts provide a full representation of the brand's social media activities and activism-related communication over the studied years, which is crucial for analyzing the brand's content evolution and tone adjustments in response to the different socio-political landscapes of each country.

3.2.2 Data Pre-Processing

The pre-processing phase ensures that the textual data accurately reflects the brand's activism communication. We aimed to isolate posts that specifically addressed activist issues promoted by Ben and Jerry's. To achieve this, we first examined the global and country-specific sections of the brand's official website, focusing on their "activism" and "values" sections. By analyzing the themes presented-such as climate justice, social equity, LGBTQ+ rights, and various other social causes-we identified core topics that consistently represented the brand's activist stance.

A dedicated dictionary for each activist topic was constructed by manually selecting key terms and phrases associated with these causes (Boegershausen *et al.*, 2022). Each topic dictionary included terms frequently used by the brand to describe the particular activist issue. For instance, climate justice terms would encompass "sustainability," "carbon footprint," "renewable," and other relevant expressions as employed in Ben and Jerry's communication. The creation of this dictionary was not limited to single keywords but also included contextually relevant word clusters and phrases to capture nuanced aspects of activism-related language. To refine these initial dictionaries and ensure their relevance and applicability to the specific Instagram profiles of Sweden, Spain, and Greece, we tailored the activist topic dictionaries to the linguistic and stylistic particularities of each country. A significant subset of data from each profile was manually selected to serve as a basis for this contextual refinement. This subset consisted of posts representative of the language style, tone, and cultural context used in the profile's communication around activism. This approach aligns with Berger and Milkman (2020), who emphasize the need for context-specific analysis when examining textual data, acknowledging the diverse cultural and linguistic nuances.

Each subset was processed using Python's Natural Language Toolkit (NLTK) library, which facilitated tokenization and linguistic analysis. Initially, the subset underwent cleaning to remove elements unrelated to the textual content, such as URLs, emojis, and hashtags, while preserving any culturally significant symbols or language that could indicate activist topics (Berger and Milkman , 2020). By retaining certain hashtags and emojis relevant to activism, we acknowledged their role in conveying tone, sentiment, and topic engagement, especially given Instagram's visual-textual hybrid nature. Next, the dictionaries were refined based on this profile-specific data. This refinement involved the addition of localized terminology, colloquialisms, and specific language patterns identified within each subset, ensuring that each country's final dictionary was tailored to the thematic scope of activism and the language style unique to each profile. For instance, phrases that capture environmental justice in Swedish might differ significantly in nuance or connotation from those used in Greek or Spanish. By tailoring the dictionaries in this way, we ensured that the classification of activist posts was precise and culturally resonant, a process supported by best practices outlined by Packard and Berger (2024) on the importance of contextual influences on textual analysis.

3.2.3 Data Analysis

The data analysis proceeded in two main phases to comprehensively understand the extent and nature of Ben and Jerry's activist communication across the selected country profiles. In the first phase, we assessed the frequency of activist posts for each profile by calculating the ratio of the total number of activist posts to the total number of posts made by the country-specific profile on Instagram. This quantitative measure allowed for a comparative understanding of the brand's emphasis on activism across Spain, Sweden, and Greece, shedding light on how Ben and Jerry's allocates its communication efforts between activism and other content. By comparing these frequencies, we could empirically examine how the brand prioritizes activism in different sociopolitical contexts, offering insights into potential country-level differences in brand engagement.

In the second phase, we analyzed the content of the activist posts using text network analysis to uncover thematic structures within the brand's communication. We employed InfraNodus software (https://infranodus.com) to carry out automatic text network analysis. This computational method allows for visualizing text as a network, where words become nodes and co-occurrences between them are represented by edges (D'Arco *et al.*, 2023). By representing text as a graph, text network analysis reveals relationships between words, enabling deeper insights into the structure of textual discourse. Unlike probability distribution-based approaches, such as Latent Dirichlet Allocation (LDA), clustering through graph theory provides a way to visualize the interconnectedness of themes and key terms within the text, thus offering a more dynamic understanding of the relationships between different activist issues and their prominence across the brand's profiles (Feyissa and Zhang, 2023).

InfraNodus uses graph theory to identify clusters of thematically similar words, creating distinct thematic areas and subtopics within the activist posts (Paranyushkin, 2019). The visualization generated by InfraNodus helped us to identify influential keywords and uncover the relationships between different themes within the text. This method was particularly valuable in highlighting how Ben and Jerry's activist communication aligns with the sociopolitical context of each country's profile. Thematic clusters derived from the analysis provided insights into how the brand emphasizes certain issues in each country. For instance, the cluster analysis showed that in Spain, themes around legislative advocacy and migrant rights were more prominent, while in Sweden, the focus was on LGBTQ+ rights and social inclusion.

To ensure the accuracy of the analysis and account for cultural nuances, we conducted the text analysis in the original language of the posts-Spanish, Swedish, and Greek-allowing the analysis to reflect the linguistic subtleties unique to each profile. InfraNodus supports these languages natively, which facilitated an accurate and context-specific analysis of each country's textual data. By maintaining the analysis in each country's native language, we were able to uncover more precise thematic connections that would have been obscured by translation. This capability of analyzing posts in multiple languages enhanced our exploration of Ben and Jerry's activism, providing insights into the themes most prominent in the brand's communication across different European countries. The text network analysis approach provided both a macro-level and a micro-level understanding of the activist content. On a macro level, the thematic clusters offered an overview of the main topics present in Ben and Jerry's activism, while on a micro level, the analysis focused on examining the relations that emerged between specific terms and concepts, revealing nuanced connections and country-specific communication dynamics These two layers of analysis, when combined, allow for robust cross-validation: the frequency analysis (macro-level) identifies broad trends, and the text network analysis (micro-level) sheds light on deeper thematic interconnections, thereby strengthening the reliability of our findings.

3.3 Study 2

Study 2 adopts a semiotic approach to delve deeper into the findings from Study 1, using a phenomenological lens to extract and analyze the underlying meanings (Lima *et al.*, 2019). This helps us understand whether and how activist communication is standardized or adapted internationally. Semiotics, as the study of signs embedded in human, natural, and mechanical communication (Gretzel and Collier de Mendonça, 2019), seeks to understand the cultural meanings embedded in languages and communication processes (Nöth and Santaella, 2017). It is particularly well-suited for analyzing visual communication elements (Skaggs, 2017). From this perspective, semiotic analysis is highly applicable to marketing research, offering an interpretive framework focused on meaning-making (Lima *et al.*, 2019). Therefore, this method is especially useful for examining how the brand adapts and standardizes elements and meanings to its activist communication across different contexts, allowing us to answer RQ2: How do brands adapt or standardize activist communication across different European markets?

3.3.1 Data collection

Based on the results from Study 1, three main themes emerged across all three countries analyzed (Sweden, Spain, and Greece). Specifically, the three themes are 1) environmental concerns; 2) human rights; and 3) LGBTQIA+ rights. Consequently, we revisited the brand's Instagram profile for each country (Rahkova *et al.*, 2023). The aim was to further explore these themes and understand the significance of activist communication for the brand and whether and how it standardizes or adapts across these three different socio-political themes. Thus, we extracted the relevant posts for each theme in each profile, collecting both the copy and the visuals through screenshots. These elements were then placed into a custom matrix for each country, creating a detailed dataset for semiotic content analysis.

3.3.2 Semiotic Content Analysis

Semiotic analysis allows us to understand the system created by a brand and how it is used to communicate meanings. Individual semiotic signs are studied separately and broken down into phases to interpret what is being communicated by a brand (Oswald, 2012). Semiotic signals can include colors, the language used, tone of voice, and images. Consequently, we categorized these signals into two macro-categories: visual codes and verbal codes (Kucuk, 2015). To ensure methodological rigor, three researchers independently reviewed all visuals and texts, classifying them according to a predefined matrix (Baldry and Thibault, 2006). We created a dictionary with the possible alternatives we used for the semiotic analysis, as shown in Table 1.

Tab. 1: Elements focused on semiotic analysis

Acronym	Meaning
S	Same visual format and same text in English language
T	Same visual format and text translated into the national language
D	Different visual format and different text in the national language
E	Different visual format and different text in English language
yes	The campaign is present in that country
n.a.	The campaign is not present in that country

Source: Source: Author's Elaboration

4. Findings

4.1 Study 1 Findings

Activist Communication Intensity and Topics

The analysis of activist-related content on social media accounts across Greece, Sweden, and Spain reveals significant variation in the frequency, focus, and prominence of activist topics in each country. Overall, Greece featured 30 activist-related posts out of 476 total posts (6.3%), Spain had 80 out of 1200 (6.7%), and Sweden had the highest proportion with 83 out of 1420 posts (5.8%). The tables below summarize the topical clusters identified in each country, highlighting the influence of specific activist themes.

The Greek Profile has a notable focus on environmental topics, such as climate action, sustainability, and fair trade (Table 2). This emphasis reflects the country's commitment to addressing environmental challenges and promoting sustainable practices. In addition to the main topics presented in the table, there are other relevant topics, such as Sustainable Communities (7%), which also indicate a community-driven approach to sustainability.

Tab. 2: Ben and Jerry's Greece - Activist Topics

Topical Cluster	Influence	Percentage of Entries	Keywords
1. Sustainability	31%	9%	sustainability, reduce footprint, future
2. Fair Trade Movement	18%	16%	climate justice, fair trade, equality
3. Climate Action	17%	7%	climate action, environment, new goals

Source: Author's Elaboration through Infranodus

In the Swedish Profile, the focus is primarily on socially controversial topics, such as transpersons' rights and safety, with significant emphasis on transpersons' safety (23%). Refugee engagement and Fairtrade advocacy are also key topics, highlighting Sweden's strong commitment to LGBTQ+ rights, humanitarian causes, and fairtrade (Table 3). Other topics, such as Children's Rights (11%), also play an important role, underscoring the country's broader focus on social justice.

Tab. 3: Ben and Jerry's Sweden - Activist Topics

Topical Cluster	Influence	Percentage of Entries	Keywords
1. Transpersons' Safety	23%	12%	transgender safety, support, awareness
2. Refugee Engagement	22%	17%	refugee support, link for details
3. Fairtrade Advocacy	23%	44%	fairtrade, ice cream, world impact

Source: Author's Elaboration through Infranodus

In the Spanish Profile, the emphasis is on veganism, climate action, and human rights. Vegan-related activism is particularly prominent, appearing as the most influential topic (Vegan Flavor at 34%). There is also a significant focus on climate action and human rights, indicating Spain's dedication to both environmental and community-oriented causes. Additional topics, such as Social Support (13%), further emphasize Spain's focus on social justice and support for marginalized groups (Table 4).

Tab. 4: Ben and Jerry's Spain - Activist Topics

Topical Cluster	Influence	Percentage of Entries	Keywords
1. Vegan Flavor	34%	17%	vegan taste, Spanish flavor, popular
2. Climate Action	21%	8%	climate change, community regulations
3. Human Rights	13%	19%	support migrants, fight for rights

Source: Our Elaboration through Infranodus

The results show that while there are some common themes across the three countries, each country also emphasizes different aspects of activism. Greece has a notable focus on environmental topics, such as climate action, sustainability, and fair trade. Sweden, on the other hand, concentrates on socially controversial topics like transpersons' safety, LGBTQ+ rights, and refugee support, with fairtrade advocacy also being important. Spain highlights veganism, climate action, and human rights, reflecting an emphasis on both environmental and community-focused activism. These differences indicate that while all three countries support a variety of activist causes, the specific focus areas and prominence of topics differ depending on each country's sociopolitical context.

Country-specific activist communication

Based on an in-depth analysis of Ben and Jerry's Instagram profiles in Spain, Sweden, and Greece using the Infranodus tool, we identified interesting patterns in activist communication linked to country-specific policies and sociopolitical contexts. In Spain, Ben and Jerry's activist messaging shows a substantial connection with government policies and specific activist organizations. Notably, terms like "reglament" (regulation), "derechos" (rights), and mentions of organizations such as "@redacoge" (a network supporting migrant rights) were frequent, indicating that Ben and Jerry's messaging in Spain often engages with local legislation concerning human rights and migrant issues. These keywords suggest an effort to align brand activism with Spain's political discourse on migration, likely aimed at influencing policy reforms. Furthermore, the word "cambi" (change), often linked to climate and social issues, was mentioned in contexts involving public campaigns and direct calls to action, reflecting a strong emphasis on advocating for legislative change.

In Sweden, Ben and Jerry's communication appears more focused on broader human rights and social inclusion themes, with a specific emphasis on LGBTQ+ activism. Words like "transgender," "human," and mentions of organizations like "@rfslungdom" (a youth LGBTQ+ advocacy group) show that the brand tailors its activist narrative towards the local sociocultural priorities. However, mentions of specific government bodies or policies are minimal, which might suggest a less direct approach towards influencing local governance compared to Spain. Instead, the communication seems aimed at fostering social change through awareness and community building, potentially due to Sweden's already progressive policies regarding LGBTQ+ rights, where public sentiment plays a pivotal role in upholding and expanding these rights.

In Greece, the activist communication strategy was less explicitly connected to governmental entities or specific policy mentions. Instead, there was a significant focus on terms related to social solidarity, such as "crisis," "refuge," and "support," reflecting Greece's sociopolitical landscape, particularly in relation to its ongoing economic challenges and refugee crisis. The brand's communication often referenced "human rights" and "migration," but with fewer direct links to policymakers or legislative advocacy compared to Spain.

4.2 Study 2 Findings

Adaptation vs Standardization of International Brand Activism: A Semiotic Analysis

Table 5 presents an overview of Ben and Jerry's campaigns across different countries and years, focusing on climate action, human rights, and civil rights. The table details each campaign's visual and textual aspects, categorizing them by the level of standardization. Specifically, it distinguishes between campaigns that (1) used the same visual format and English text, (2) used the same visual format but translated the text into the national language, (3) employed different visual formats with localized texts, or (4) utilized different visual formats and retained English text.

Interestingly, these campaigns frequently aligned with three major global events in most countries analyzed: Earth Day for environmental issues, World Refugee Day and Fairtrade Day for human rights, and International Pride Month for LGBTQIA+ rights.

Focusing on the Earth Day campaign, we observed high standardization, with uniform presentations across multiple countries. On the other hand, the World Refugee Day campaign tended to feature varied visual formats and texts in national languages. Similarly, the Fairtrade Day and International Pride Month campaigns exhibited lower levels of standardization, suggesting that cultural and moral factors influenced the adaptation of these campaigns or, in some cases, led to their absence in specific countries.

Tab. 5: Semiotic analysis

Issue	Campaign	Year	Country		
			Sweden	Spain	Greece
Climate action	Earth day	2021	S	T	D
		2022	n.a.	n.a.	n.a.
		2023	S	D	n.a.
Human rights	World refugee day	2021	E	E	n.a.
		2022	n.a.	n.a.	n.a.
		2023	D	D	n.a.
	Fairtrade day	2021	S	D	n.a.
		2022	n.a.	D	
		2023	n.a.	n.a.	n.a.
Civil rights	International Pride Month	2021	E	D	E
		2022	S	D	S
		2023	n.a.	D	E

Note: S: Same visual format and same text in English language; T: Same visual format and text translated into the national language; D = Different visual format and different text in the national language; E = Different visual format and different text in English language; yes = the campaign is present in that country; n.a. = the campaign is not present in that country.

Source: our elaboration

5. Discussions

The results of this study provide critical insights into the extent and nature of Ben and Jerry's activist communication across European countries, contributing to a broader understanding of how MNEs navigate activism in diverse sociopolitical contexts.

The findings from the frequency analysis of activist posts demonstrate that the extent of commitment to activism varies significantly across Ben and Jerry's country-specific profiles, shedding light on how sociopolitical and cultural factors influence the prioritization of activist messaging (RQ1). In Sweden, for instance, the high proportion of activist content may reflect a more favorable institutional environment for advocacy and cultural receptiveness to progressive messages (Podnar and Golob, 2024; Livas *et al.*, 2023). In contrast, Greece exhibited lower activist content, potentially due to factors such as restricted press freedom and sociopolitical conservatism, which constrain the efficacy and acceptability of activism (Reporters Without Borders, 2023)

The text network analysis further enriched our understanding of the thematic structure of Ben and Jerry's activist communication, providing a nuanced view of how brand messaging adapts to different sociopolitical contexts. Using InfraNodus, the text network analysis allowed us to identify thematic clusters representing distinct but interrelated activism areas within the discourse. For example, clusters emerged around climate action, LGBTQ+ rights, economic justice, and migration. In Sweden, the network emphasized the importance of environmental sustainability and LGBTQ+ issues, which aligns with the country's progressive policies and cultural openness. In Spain, economic inequality and labor rights clusters were more prominent, indicating a local focus on socioeconomic issues that resonate with the national context, where political discourse often centers on equality and justice (Ghauri *et al.*, 2021).

Analyzing the relationships between thematic clusters at the micro level further revealed how Ben and Jerry's activism reflected country-specific cultural narratives and social priorities. For example, the interconnectedness of themes like LGBTQ+ rights and community support in Sweden contrasted with the thematic connections between labor rights and social justice in Spain, illustrating how the brand adapted its discourse to match the prevailing social climate of each country. The relationships between these clusters highlighted the intricate ways Ben and Jerry's communicates its messages, ensuring they resonate with local audiences by aligning with nationally relevant issues.

The semiotic analysis of specific campaigns, such as Earth Day, World Refugee Day, and International Pride Month, further illuminates how Ben and Jerry's balances standardization and adaptation across European markets. The Earth Day campaign illustrated a strong trend toward standardization, highlighting the universal appeal of environmental issues and allowing Ben and Jerry's to maintain a consistent visual and textual narrative across Sweden, Spain, and Greece. Such consistency suggests that global environmental concerns are perceived as less contentious, making them suitable for a unified approach across different markets (Nambisan, 2020).

In contrast, World Refugee Day and International Pride Month campaigns demonstrated significant variability, reflecting the brand's adaptation to align with diverse cultural sensitivities and moral considerations. For example, World Refugee Day's textual and visual elements varied considerably between Spain and Greece, likely in response to local public sentiment towards migration (Shishkina and Iassaev, 2018). Similarly, the International Pride Month campaign adjusted its tone and imagery to better align with the sociocultural context of each country, highlighting the necessity for MNEs to adapt their activism to respect local cultural expectations and social norms (Saracevic and Schlegelmilch, 2024).

By integrating social, political, and cultural distance dimensions into its strategy formulation for international brand activism, Ben and Jerry's has successfully navigated the complexities of engaging in activism across different markets. Understanding these distance dimensions allowed the brand to ensure its activism aligned with global values and local cultural contexts, thereby enhancing both the impact and acceptance of its messages across diverse markets (Bucley *et al.*, 2017; Van Zanten and Van Tulder, 2018). However, these findings also underscore the heightened risks of "woke washing" or accusations of hypocrisy when a brand's local adaptations appear to conflict with its global stance, suggesting that authenticity must be carefully maintained across all markets.

6. Theoretical Implications

This pioneering research establishes crucial foundations for understanding international brand activism, representing a significant leap in studying how MNEs engage in brand activism across diverse global contexts. It is the first to undertake an international comparison of brand activism communication, unravelling the complex interplay between local, glocal, and standardized strategies within the fraught terrain of social, political, economic, and environmental issues (Mukherjee and Althuizen, 2020). This study lays the groundwork for a more holistic conceptualization of international brand activism, extending the existing theoretical constructs in brand activism research.

The findings reveal the contingent nature of brand activism strategies, underscoring the need for standardization and adaptation in international markets, similar to theories in international advertising. Contingency perspectives suggest a distinction between advertising strategy and execution regarding standardization, while adaptation depends on situational factors such as demographics, language, and local culture. By applying these insights to the context of brand activism, this research helps broaden the understanding of how situational factors impact the formulation and execution of activism campaigns in different countries (Livas *et al.*, 2023). In other words, brand activism may be integrated into existing international marketing frameworks that weigh the benefits of global coherence against the advantages of local adaptation, while recognizing additional ethical and reputational risks unique to socio-political engagement. The study also provides an operational framework for examining how varying levels of press freedom and local policies shape the implementation of brand activism across different sociopolitical contexts. Further, we highlight that heightened scrutiny in countries with high press freedom can lead to intensified reputational risks, thus emphasizing the need for authenticity and transparency in brand activism.

The research contributes to grand challenges literature by exploring how brand activism can address complex, multinational social issues such as climate change, inequality, and human rights (Ghauri *et al.*, 2021). Given that grand challenges are inherently multinational in scope, the role of MNEs as agents of social change is increasingly crucial. Therefore, this study provides theoretical foundations for understanding how MNEs can leverage brand activism to create value for their stakeholders and society at large (Kolk *et al.*, 2010). By understanding brand activism as a potential tool to navigate foreign markets and contribute to global sustainability efforts, this research highlights the strategic importance of integrating activism into business practices to tackle cross-border socio-political challenges.

The study adopts a comprehensive approach, combining quantitative and qualitative analyses to dissect digital brand activism on Instagram. Quantifying the frequency and scope of MNEs' communications on specific contentious topics provides a robust framework to assess the extent and focus of their activism efforts. This quantitative foundation offers a broad overview of MNEs' commitments to various causes, establishing a baseline for understanding their engagement levels with controversial issues. Moreover, the research unveils the deeper meanings behind activist communication by including qualitative methods like semiotic analysis. The semiotic analysis of campaigns like Earth Day, World Refugee Day, and International Pride Month reveals the strategic adaptation of visual and textual elements to resonate with local cultural and moral values, emphasizing the importance of cultural sensitivity in brand communication (Saracevic and Schlegelmilch, 2024).

The integration of cross-country comparisons highlights how activism strategies may diverge due to differences in cultural expectations, political landscapes, and public attitudes. The study finds that the perception of brand activism differs substantially across consumer segments, and the importance consumers attach to specific controversial issues varies significantly by country (Saracevic and Schlegelmilch, 2024; Mukherjee and Althuizen, 2020). This dynamic affects how often and with what intensity brands engage in activism, impacting the motivation and frequency of activism campaigns. Understanding these contextual differences is vital for MNEs seeking to implement activist strategies that resonate effectively with local audiences, ensuring both authenticity and legitimacy.

7. Managerial Implications

Building on our findings, MNEs' brand managers can adopt a series of actionable strategies to navigate the complexities of engaging in brand activism across Europe's diverse socio-political landscapes:

Strategic Issue Selection: MNEs must carefully choose which issues to advocate for, considering both global brand identity and local sentiment. Universal topics like climate action may be standardized across regions to maintain cohesion, whereas more culturally sensitive issues (e.g., LGBTQ+ rights, immigration) might necessitate adaptation to respect local norms or media environments.

Tone and Language Calibration: Press freedom plays a pivotal role in shaping the tone and directness of activist communication. In high-press-freedom environments (e.g., Sweden), a brand can adopt a bolder stance without as much concern for censorship. However, doing so may also invite closer scrutiny of the brand's authenticity. In countries with restricted press freedom (e.g., Greece), a more cautious communication style might help mitigate backlash or censorship.

Visual and Textual Consistency vs. Localization: Our semiotic analysis indicates that campaigns such as Earth Day can easily be standardized to emphasize environmental responsibility globally, whereas campaigns on sensitive topics, such as Pride Month or refugee issues, benefit from local tailoring. Managers should thus decide which elements, visuals, language, call-to-action, require adaptation for local impact.

Policy and Advocacy Alignment: In certain markets, referencing policy or legislation can lend credibility to brand activism. In Spain, for instance, Ben and Jerry's leveraged local organizations and legislative discussions around migration, illustrating that explicit policy alignment can enhance local legitimacy. However, in more conservative or restrictive press environments, direct references to policy may prove risky.

Authenticity and Transparency: The ever-present risk of being labeled as "woke washing" underscores that sincerity is paramount. If a brand's global stance contradicts its local communications, the dissonance can erode consumer trust. MNEs should ensure that their activism is backed by tangible actions, internal policies, and consistent messaging across markets.

Cross-functional Coordination: Brand activism typically goes beyond marketing to involve corporate social responsibility teams, legal advisors, and even operations managers. A cross-functional approach ensures that activist messaging is consistent with the company's overall values, reducing the risk of misalignment between internal practices and external messaging.

By considering these strategies, brands can more effectively address local and global concerns while maintaining a coherent activist identity. This not only helps build consumer trust and brand equity but also bolsters the brand's legitimacy in the eyes of diverse stakeholders.

8. Conclusions

The primary conclusion of this study underscores the essential need for MNEs to maintain a delicate balance between global brand objectives and local market sensitivities when implementing brand activism strategies. Gaining legitimacy to address socio-political challenges across varied contexts necessitates a profound commitment to local communities and a comprehension of unique cultural and social dynamics (Hooper, 2016). Our research highlights that the success of such initiatives critically hinges on the ability of MNEs to adapt their messaging and tactics to fit the diverse cultural, social, and political landscapes in which they operate. This involves a strategic choice between standardization efforts for broader appeal and adapting approaches to resonate more deeply within specific markets. The decision on this spectrum significantly affects the activism efforts' credibility, reception, and overall impact.

Furthermore, while brand activism presents an opportunity to positively influence social conditions in the countries where brands operate, it must be approached cautiously. If not managed carefully, such efforts can backfire, damaging the brand's reputation or being dismissed as mere "woke" moves that fail to genuinely address issues and instead polarize consumers (Rhodes, 2023). This underscores the importance of crafting activism strategies that are not only aligned with the brand's values but are also sensitive to and informed by the socio-political context of each market.

Therefore, the key takeaway from this study is that MNEs looking to leverage brand activism as a tool for positive change must invest in comprehensive local market analysis to guide their strategies. This ensures that their efforts are seen as authentic and relevant by the target communities and contribute meaningfully to the social discourse and challenges specific to each region.

This research is a foundational step towards a deeper understanding of how effective brand activism can bridge the gap between global connectedness and local relevance, ultimately enhancing MNEs' roles as catalysts for societal change and demonstrating the profound potential of thoughtfully executed corporate activism. This strategic approach helps prevent the pitfalls of misaligned activism and fosters a more impactful and respected presence in the global market.

9. Limitations and Future Directions for Research

While our analysis provides insights into the dynamics of digital brand activism through Instagram, we also recognize some limitations and opportunities for future research. Our research, primarily centered on Instagram, represents just one facet of digital communication. This focus limits the generalizability of our findings across other platforms where audience engagement and content strategies might differ. Additionally, quantitative measures of activism intensity might not fully capture these campaigns' qualitative impact and public reception, potentially overlooking subtleties in consumer sentiment and cultural reception.

Future studies should extend the investigation to other social media platforms, official websites, and digital campaigns to offer a holistic view of brand activism. This would help us understand how different platforms are leveraged for varied strategic purposes. Longitudinal research might also illuminate how brand activism evolves over time in response to shifting socio-political climates, capturing the fluidity of consumer sentiment and policy changes.

Comparative research across multiple MNEs in various industries could shed light on whether activism outcomes differ based on a brand's sector or product category. Some industries may be more naturally aligned with socio-political engagement, food and beverage, for example, while others might face steeper challenges in connecting with social causes. Delving into qualitative methods such as in-depth interviews with brand managers and stakeholders could offer more detailed perspectives on managerial decision-making processes behind activist strategies.

Finally, future research could explore the role of emerging technologies, such as AI-driven sentiment analysis, in shaping brand activism strategies, helping brands to continuously monitor and adapt their messages in real time. Investigating how brand activism is institutionalized within corporate structures and supply chains may also reveal new directions for achieving long-term impact and authenticity across international contexts.

By addressing these areas, future research can build on the foundational insights provided by this study to offer a more nuanced understanding of how MNEs function as agents of change in a globally connected yet culturally diverse world. This would enhance corporate social responsibility and foster strategic business growth within the complex landscape of international markets.

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Unveiling the different shades of well-being to improve managerial decision-making[1]

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Abstract

***Frame of the research**. Well-being is a concept that has attracted scholars' interest for centuries. In the last decades, workplace well-being has gained academic research attention. Nevertheless, a holistic approach to how workplace well-being is related to the decision-making process is currently missing. A conceptualization of well-being influencing the decision-making process is therefore provided.*

***Purpose of the paper.** The study aims to investigate well-being from managers' perspective, highlighting the factors that shape workplace well-being, thereby affecting the overall decision-making process.*

***Methodology**. A qualitative approach is adopted, employing a single case study methodology. As a key and distinctive company that promotes well-being, Cisco is chosen. Through the collection of 973 reviews of Cisco managers from a worldwide job platform (i.e., Indeed), a thematic content analysis is performed.*

***Results**. The results show that psychological, social, and contextual factors are interconnected and contribute in a balanced way to workplace well-being.*

***Research limitations.** The investigation of a single case study does not allow generalizations.*

***Managerial implications.** The study demonstrates that managers can affect workplace well-being. In this direction, it is valuable to inspire and support managers to be proactive, supportive, collaborative, and ready to adapt and react to change to facilitate a smooth decision-making process.*

***Originality of the paper.** Despite the prolific research on well-being, few studies focus on adopting a manager's perspective to understand how well-being can affect the decision-making process. Both the multidimensional and multilayered nature of workplace well-being are addressed in the study.*

Keywords: *well-being; workplace well-being; managerial decision-making; Cisco managers; Indeed platform*

1. Introduction

In 2004, the World Health Organization (WHO) defined well-being as a state "which allows individuals to realize their abilities, cope with the normal stresses of life, work productively and fruitfully, and make a contribution to their community" (p. 23). It has attracted the interest of policymakers, scholars, and practitioners over centuries. Thus, well-being is rooted in the speculation of the godfathers of Western philosophy, Plato, Socrates, Epicurus, and Aristotle, allowing us to approach this construct alternatively, according to the hedonistic or the eudemonistic perspective (Deci and Ryan, 2008). The hedonistic perspective considers a good life to be based on seeking pleasure and the avoidance of negative feelings, while the eudemonistic perspective considers it to be the extent to which individuals have realized their potential and have achieved a meaningful life (Scaria *et al.*, 2020).

These seminal approaches and their etymology demonstrate that the foundations of well-being lie in its positive charge, essential to balancing psychological, social, and physical instances of individuals and organizations (Dodge *et al.*, 2012). This approach emerges from the positive feelings (e.g., happiness and satisfaction) and the functioning elements (e.g., engagement and self-acceptance) that should always inform psychological, social, and even economic processes. Recently, well-being's main dimensions have been summarized in three different but interrelated macro categories: subjective, material, and relational (White, 2008). Moreover, its ability and/or willingness to balance multidimensional challenges and resources, such as physical health, happiness, work-life balance, work environment, social support, education, and security, make well-being a complex construct that is still under the scrutiny of policymakers, scholars, and practitioners (Wassell and Dodge, 2015).

The complex and multidimensional nature of well-being makes it difficult to define it univocally (Dooris *et al.*, 2018). The following alternative definitions confirm the lack of a common approach to well-being. Sirgy (2021) considered it to be the ability or the aspiration to satisfy salient life domains, while Diener *et al.* (2002) approached it as "a person's cognitive and affective evaluations on his or her life" (p. 63). Moreover, Simovska and O'Toole (2021) defined well-being as 'being well' or "having an optimal psychological experience and functioning" (p. 172), which, according to Alatartseva and Barysheva (2015), has subjective (self-assessed) dimensions related to individual human and spiritual characteristics and features, and objective (ascribed) dimensions coming from individuals' perception and evaluation of human society.

Subjective and objective well-being sheds light on a further characteristic of inner well-being-its multilevel nature, which, together with its multidimensionality, contributes to its complexity.

On the one hand, subjective well-being is inspired by the ancient Greek hedonistic philosophy and can be defined as "the frequency and intensity of experiences of joy, fascination, anxiety, sadness, anger, and affection that makes life pleasant or unpleasant" (Kahneman and Deaton, 2010, p. 164). As stated, this approach lays its foundations on people's evaluation of their lives and encompasses both cognitive judgments of satisfaction and affective appraisals of moods and emotions (Diener *et al.*, 1999, 2002). Dealing with subjective well-being, Diener (1984) described it as an overall assessment of feelings and attitudes about an individual's life at a particular point in time, ranging from negative to positive and therefore coming from a combination of positive affect and life satisfaction.

On the other hand, objective well-being is inspired by Aristotle's main concept of eudemonia (or εὐδαιμονία, derived from εὐδαίμων, or happy), intended not as a personal and hedonic feeling of happiness, but rather as a positive feeling toward manifestations of things that are objectively valuable and contribute to an overall assessment of the quality of life (Hirai *et al.*, 2016; Sean, 1986). However, despite the above-mentioned differences, the inner complexity of well-being blurs the boundaries between these two approaches, making them not competing but rather two facets of a general construct (Forgeard *et al.*, 2011). However, it is worth noting that both the objective approach to well-being and its eudemonic approach relate to organizational well-being, intended "as the first step of an organizational development process" (Sancassiani *et al.*, 2015, p. 11), requiring the ability to promote and maintain employees' physical, psychological, and social well-being (Boccoli *et al.*, 2022; Torri and Toniolo, 2010). This peculiar declination of well-being has recently been approached as both a strategy and a responsibility due to the blurring of the line between work and life, which has led managers to take responsibility for creating a more positive and productive workplace (Lambert *et al.*, 2019; Spence, 2015). In this sense, when applied to the workplace, well-being-which, in a nutshell, is "how we feel at work and about our work" (De Neve and Ward, 2023, p. 3)-emphasizes the importance of social interactions typical of a specific workplace (Bartels *et al.*, 2019). This has led to a focus on eudemonic endeavors toward the quality of external relationships and the intrapersonal dimensions essential to creating common purposes within an organization (Putra *et al.*, 2024). Therefore, to achieve general well-being within a business organization and in a specific workplace, the participation and empowerment of people or employees are essential (Butts *et al.*, 2009; Franco-Santos *et al.*, 2021).

This implies that when employees are committed to the organization and engaged with processes, they tend to have positive feelings and a positive attitude, essential to experience a general sense of wellness, which can positively affect the decisions that inform their behavior (Boxall and Macky, 2014; Eatough and Spector, 2014). This opens up a research gap in terms of if and how the different dimensions of the construct under investigation impact both subjective/internal and objective/external well-being, which calls for further investigation into if and how well-being can positively affect the decision-making process. Particularly, despite the prolific body of research on well-being, there remains a notable gap in the literature when it comes to adopting a manager's perspective to explore how well-being influences the decision-making process.

This study aims to bridge this gap by identifying the main factors at the core of workplace well-being and their influence on decision-making. Two main inquiries inspired this analysis:

RQ1: What are the factors that mostly affect managers' well-being?

RQ2: How does a perceived sense of well-being affect managers' approach to the decision-making process?

To address these issues, an explorative analysis is conducted, assuming managers' perspectives to investigate well-being as a multidimensional construct that affects the decision-making process. The general remainder of the paper is organized as follows. Section 2 presents the theoretical background, Section 3 describes the research setting and the methodology adopted, and Section 4 illustrates the main results. Section 5 offers a discussion of the study and Section 6 highlights implications, limitations, and future research.

2. Theoretical Background

2.1 A multilevel and multidimensional approach to well-being: a focus on organizations and workers

Even though well-being is globally central to public policies and individuals, it remains "a complex multi-faceted construct that has continued to elude researchers' attempts to define and measure" (Pollard and Lee, 2003, p. 60). The inner complexity of this construct is due to the intertwining of different levels and dimensions, which various nuanced definitions-deeply dependent on the conceptual approach that different disciplines (e.g., psychology, sociology, philosophy, politics, etc.) have embraced-have highlighted over time. To counteract this situation and offer a systematic approach to well-being, the focus must be both on the differences and on the similarities between two main essential levels: the objective or external level, and the subjective or internal level of well-being (Norwich *et al.*, 2022). If objective well-being stems from individuals' perception and evaluation of human society and aims at meeting essential or basic needs in terms of social norms and values, subjective well-being aims at responding to subjective needs and managing personal experiences according to personal characteristics and features (Conceição and Bandura, 2008). Moreover, subjective (or internal) well-being can be declined at the micro level as individual well-being, which is generally defined as the evaluation of life quality, coming from individuals' "perception of their position in life in the context of the culture and value systems in which they live and about their goals, expectations, standards and concerns" (WHO, 1995, p. 1406).

By considering the two levels of well-being, Alatartseva and Barysheva (2015) identified the following main characteristics of well-being: 1) an existence in harmony with others and the environment; 2) an innate understanding of what is good and the ability and willingness to achieve it; 3) individuals' ability to realize their human potential and plan for life; and 4) the creation of a society and the empowerment of people to fulfill the above-stated positions. However, the complexity of well-being lies not only in its two levels (subjective and objective), but also in its multiple and often intertwined dimensions, which call for a dynamic and always new balance. In this sense, Sundriyal and Kumar (2014) considered well-being based on three main dimensions: physical, psychological, and social. In more detail, the physical dimension is related to what can be achieved in terms of health status, functional outcome, and/or quality of life, while psychological well-being comes from good and proper psychological functioning, possibly thanks to the intertwining of self-acceptance, positive relations, personal growth, purpose in life, environmental mastery, and autonomy. Finally, the social dimension of well-being deals with a personal ability to interact in a community successfully and respectfully, as well as in other social contexts. This dimension is based on interpersonal relationships, social support networks, and community engagement. Even though these dimensions differently impact both objective and subjective levels of well-being, according to Maslow (1943), their dynamic combination-the reduction of tension between the urgency of needs and goals as well as their satisfaction-can lead to a holistic sense of well-being and even a more general sense of happiness (Cosimato *et al.*, 2021; Oishi *et al.*, 2009).

Due to the dialogic dynamics existing between the two main levels of well-being (objective and subjective), individual well-being at the organizational level is highly influenced by a sub-dimension of social well-being-that is, workplace well-being or people's "satisfaction at work, and the emotional and psychological experience and health status expressed at workplaces" (Zheng *et al.*, 2015, p. 623). Even though workplace well-being is a blurred concept, which several disciplines have approached and defined differently, the Chartered Institute of Personnel and Development defined it in 2007 as a bio-psycho-social construct that includes physical, mental, and social health, referring to the several issues related to the different dimensions of employees' sense of wellness (Brauers, 2008; Wallace, 2022). This concept is attracting growing attention among policymakers, managers, and others due to the disruptive phenomena that are currently changing socio-economic scenarios and subverting individuals' priorities and the way people approach work and life satisfaction (Baccarani *et al.*, 2013; La Placa *et al.*, 2013). In this sense, it is also worth noting that workplace well-being is highly influenced by job satisfaction, which can be positively or negatively affected by contextual, physical, and psychological elements (Bertrandias *et al.*, 2021; Daniels *et al.*, 2022; Spence, 2015).

2.2 Factors to assess workplace well-being

Due to the advent of the digital revolution and other dramatic events (e.g., the Covid-19 pandemic), the workplace is globally undergoing a disruptive transformation, mainly based on remote and virtual team working (Avery and Zabel, 2000; Bennett and McWhorter, 2021; Chamakiotis *et al.*, 2021; McPhail *et al.*, 2024). Together with this, well-being within the workplace and its consequences represent a major issue and a matter of concern for policymakers, companies, and employees at the global level (Wallace, 2022). This also calls for new approaches and strategies aimed at managing human resources; thus, employee well-being is one of the main components of workplace relations (Droulers *et al.*, 2020, p. 5). Moreover, assuming a managerial perspective, workplace well-being represents the turning point of human resource management (HRM) (Wright *et al.*, 2007), based on the so-called 'happy, productive' worker hypothesis (Peccei, 2004; Peccei *et al.*, 2013; Zelenski *et al.*, 2008) and the possible contribution that managers can offer through a participative and innovation-driven leadership (Inceoglu *et al.*, 2018). De Neve *et al.* (2013) pointed out the positive influence that emotions such as a sense of personal satisfaction and well-being can also act on human decision-making at the organizational level. This implies that managers with a good sense of well-being and with a generally positive attitude toward the company tend to "make decisions about how to allocate scarce resources in ways that are conducive to worker wellbeing" (De Neve *et al.*, 2013, p. 10), balancing rational and emotional factors. In doing so, programs and actions aimed at achieving mutual gains for both employers and employees, such as healthy and balanced lifestyles, are needed (Van De Voorde *et al.*, 2012; Watson *et al.*, 2023). However, assuming the opposite perspective of critical management studies (CMS), work is considered one of the main determinants of employees' wellness. Thus, this approach considers workplace well-being programs intended to create the 'fit' employee (Cederström and Spicer, 2015; Johansson *et al.*, 2017) or individuals' fit with work (Wallace, 2022).

Like the general concept of well-being, workplace well-being can be articulated into individual or subjective and social or objective levels. The first (individual or subjective) is based on three main elements: job satisfaction, affective or emotional experience of work, and meaningful and purposeful work (De Neve and Ward, 2023, p. 1145). These dimensions are based on Foucault *et al.*'s (1995) approach to workplace well-being, considered as employees' disposition to engage in ethical self-work based on self-conduct and on specific forms of ethical subjectivity rather than on healthy activity (Baccarani, 2008). Here, ethics delves into "the manner in which one ought to conduct oneself-that is how one ought to form oneself as an ethical subject" (Foucault, 1990, p. 26), which, in a nutshell, is the "relationship you ought to have to yourself" (Foucault, 2000, p. 352). This implies that workplace well-being is also highly influenced by individuals' level of engagement with ethics and by their disposition to inspire personal self-conduct toward it. Moving to the social or objective level of workplace well-being, it is worth noting that in this case there are also three main characteristics: a supportive team culture, delivering excellent services, and professional development opportunities (Anderson *et al.*, 2021).

The extant literature recognizes that the three main dimensions of general well-being-psychological, social, and contextual/physical-can also be applied to workplace well-being (Sundriyal and Kumar, 2014). Focusing on these three dimensions, it is worth noting that psychological well-being is related to individual and internal experiences/feelings (e.g., the experience of happiness and self-realization), while social well-being refers to the quality and degree of individual interactions with peers and with society and nature. Finally, contextual well-being is related to environmental conditions that characterize individuals' lives and/or workplaces (Franco and Blasi, 2013).

3. Methodology

3.1 Research setting and design

This study aims to contribute to the research on organizational well-being assuming a managerial perspective. Particularly, it investigates what mostly affects managers' well-being and if it influences their decision-making approach. In doing so, an exploratory case study analysis has been conducted, focusing on Cisco System Inc. as an extreme case. Analysis of an extreme case study is an appropriate method for gaining insights from rare or unusually positive or negative complex phenomena (Eisenhardt, 1989; Tellis, 1997). The case study analysis is conducted by implementing thematic analysis, a research method based on a data analysis strategy used for "identifying, analyzing, and interpreting patterns of meaning ('themes') within qualitative data" (Clarke and Braun, 2017, p. 298). Thematic analysis is a comprehensive process "where researchers can identify numerous cross-references between the data and the research's evolving themes" (Alhojailan, 2012, p. 12). The analysis was conducted by gathering data from the Indeed online job search platform, considering Cisco System managers' comments. The case company is the worldwide leader operating in the information technology sector, offering an industry-leading portfolio of technology innovations by focusing on the design, manufacture, and sale of networking hardware, telecommunications equipment, and other high-technology services and products such as routers, switches, networking software, security solutions, collaboration tools, data center technology, and cloud-based services (https://www.cisco.com/c/en/us/about.html). Table 1 shows the main structural characteristics of the case company.

Tab. 1: Cisco Systems Inc. profile

Date of foundation	1984
Headquarters	San Jose, California, USA
Revenue in 2023	US$ 57 billion
Employees	84,900
Countries	95

Source: Our elaboration of Purpose Report 2023

3.2 Data collection and data analysis

Data collection was conducted on textual material about Cisco Systems Inc. managers' approach and perception of well-being published on the Indeed platform. Cisco Systems Inc. represents best practice in terms of a positive workplace environment. This is proved by the fact that the case company was awarded the "Fortune 100 Best Companies to Work For" in the USA in 2023 for the third year running, and it gained the bronze medal for the "World's Best Workplace" award. These awards are assigned by Fortune and Great Place to Work, a research institute focused on workplace culture that has been publishing the Best Companies list for 26 years.

The Indeed platform was selected because, since 2019, it has collected and disseminated work well-being data on a very large scale, gathering more than 15 million survey responses in the USA alone, and becoming the platform with the largest data on workplace well-being (De Neve and Ward, 2023). Querying the Indeed platform, data were collected in December 2023, when 6,400 reviews were retrieved. The following inclusion criteria were set for data collection: reviews published in English by US Cisco managers who had written two or more reviews since the birth of the Indeed platform.

Tab. 2: Inclusion criteria

Inclusion criteria	
Type of document	Online review
Data source	Indeed platform
Authorship	US Cisco business managers
Publication date	August 2011-December 2023
Language	English

Source: Authors' elaboration.

Review selection was performed through an open-ended iterative search process (Finfgeld-Connett and Johnson, 2013) based on an ongoing search, reading, and refining of the selected texts. In so doing, researchers selected 973 comparable texts responding to the inclusion criteria. The privacy of reviewers, confidentiality, and anonymity of reviews' authors were ensured, reporting just their function, such as managers (i.e., senior manager or task manager) involved in the following business functions: business development, operations, marketing, finance, HR, IT, R&D, and sales. Data were analyzed by performing thematic content analysis through QSR NVivo 14 software. Thematic content analysis is a qualitative research technique aimed at exploring a specific phenomenon through an inductive or deductive process to generate a theoretical understanding (Corbin and Strauss, 1990). This method is well-suited to analyzing textual resources, identifying specific themes or concepts, and counting their occurrence (or frequency of occurrence). It makes it possible to describe, analyze, and report patterns in the data (themes) (Braun and Clarke, 2006, 2019). In line with the selected method, a coding scheme was developed and applied based on three main coding categories derived from the main levels of workplace well-being and some specific themes for each category (Table 3).

Tab. 3: Coding categories and themes for the analysis

Categories	Themes
Psychological	Personal traits Professional development Personal growth
Social	Culture Relationships Values
Contextual	Work environment Organizational features Self-achievements

Source: Authors' elaboration.

To better depict the coding process at the core of the thematic analysis, Table 4 provides a coding manual example. In this way, the coding process automatically conducted using the software is better detailed, focusing on the single steps: 1) screening data sources; 2) selecting data; 3) sorting categories; and 4) linking themes. This process makes it possible to index a text into categories and establish a "framework of thematic ideas about it" (Gibbs, 2007).

Tab. 4: Coding process

Data source	Example of data	Initial category	Emergent themes
Indeed platform	"On any given day, I might partner with CS leaders, or PS technical subject matter experts, or sales enablement on projects and programs to drive customer value".	Contextual well-being Social well-being	Work environment Self-achievements Relationships
Indeed platform	"Had a lot of lesson learned and guidance from the team. It was difficult but I was able to pick up what they were putting down and their help was very useful in the long run".	Psychological well-being Contextual well-being	Professional development Personal growth Work environment Self-achievements
Indeed platform	"Great place to work, excellent culture that genuinely promotes a work/life balance whilst maintaining high levels of productivity and efficiency. A perfect environment for ingenuity and creativity".	Psychological well-being Social well-being Contextual well-being	Personal traits Culture Work environment
Indeed platform	"I learned so much about my capabilities as well as my ability and willingness to learn more. Cisco provides many job paths for an individual. I worked with some of the most intelligent minds out there as well as made lifelong friendships".	Psychological well-being Social well-being	Professional development Personal growth Relationships
Indeed platform	"On the engineering side of the business, the intensity and innovation factor is very high. Dynamic work environment, fast-paced-and great people".	Contextual well-being	Organizational features Work environment

Source: Authors' elaboration.

4. Results

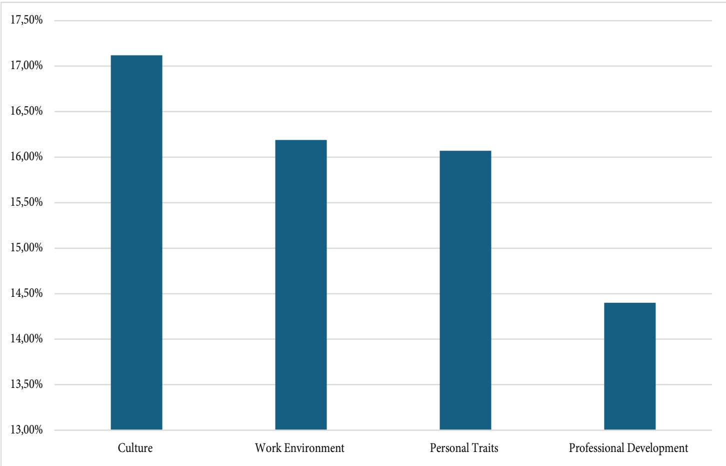
To organize the themes and sub-themes related to workplace well-being, the main categories that emerged from the literature (psychological, social, and context) were used. The results achieved from the thematic analysis of the selected sample of documents (Cisco's managers' online reviews) were synthesized: the following tables and figures show the main findings. They point out the main factors (and the related sub-factors) that affect the three main levers of managers' well-being at their workplace.

The results demonstrate that the first category, named 'psychological', and its associated themes were the most recurrent in the analyzed texts

(35.99%), followed by 'context' (32.05%) and 'social' (31.96%) (see Appendix A). Moreover, the results demonstrate a relatively narrow margin, especially between the last two categories.

Focusing on the themes associated with the aforementioned categories (Table 5), the results achieved by analyzing the selected reviews demonstrated that the most prevalent theme was culture (17.12%), belonging to the less frequently occurring category 'social'. It is worth noting that there is a significant margin between occurrences of the other themes associated with this category. Work environment (context) accounted for 16.19 percent of total occurrences, and personal traits (psychological) for 16.07 percent. In this case, this theme demonstrates a narrow margin with the sub-theme of professional development (14.4%). This led us to understand the factors that mainly influence managers' perception of workplace well-being at the main levels, actualized in the psychological, social, and contextual dimensions.

Tab. 5: The most occurring themes

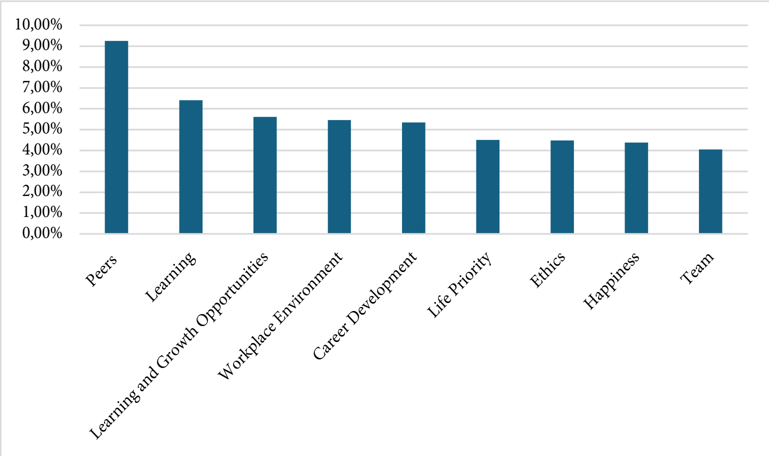


Source: Authors' elaboration.

To better understand the main nuances of the three main categories of workplace well-being, it is worth focusing, too, on the occurrence of sub-themes (see Appendix A) related to the issues that managers perceive as most impactful on personal and professional dimensions of psychological well-being, on cultural and relational dimensions of social well-being, and on organizational and material dimensions of contextual well-being.

It is worth noting that none of the detected sub-themes recurred more than 8.33 percent of the total sub-themes (Table 6). This implies a high fragmentation between Cisco managers' perceptions of the main discriminant of the themes attached to psychological, social, and contextual well-being. The most recurrent sub-themes associated with the psychological dimension are learning (6.41%), career development (5.35%), life priority (4.51%), and happiness (4.38%), while those associated with the social dimension are peers (9.25%), ethics (4.48%), and team (4.05%). Finally, the most recurrent sub-themes attached to the contextual dimension are workplace environment (5.46%) and learning and growth opportunities (5.61%). All the other sub-themes accounted for less than 4 percent of the total occurrences.

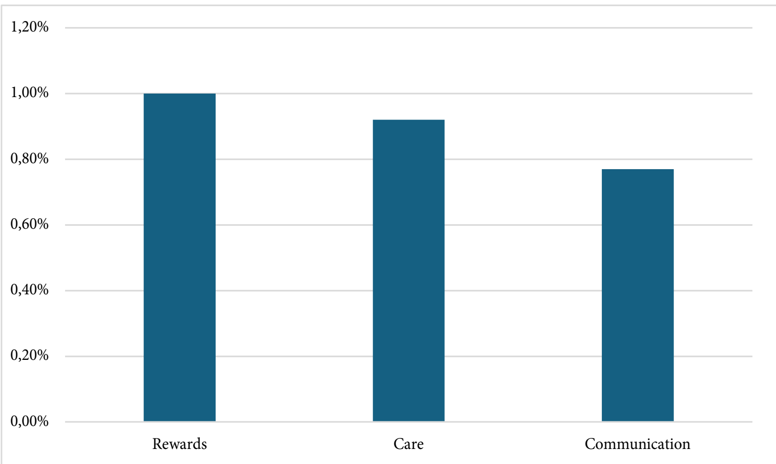
Tab. 6: The most recurrent sub-themes



Source: Authors' elaboration.

It is also interesting to focus on the less recurrent sub-themes. Doing so identifies the sub-themes which are less than or equal to 1 percent, such as communication (0.77%) and rewards (1%) (contextual dimension), and care (0.92%) (social dimension) (Table 7).

Tab. 7: The less recurrent sub-themes



Source: Authors' elaboration.

5. Discussion

The results presented in the previous section and synthesized in Table 8 make it possible to address the first research question at the core of this study: what factors most affect managers' well-being?

Tab. 8: Comparison between the most and least frequent themes and sub-themes

Category	Theme	Most recurrent sub-themes (> 4%)	Least recurrent sub-themes (< 1%)
Psychological	Personal traits (16.07%)	Learning (6.41%) Career development (5.35%) Life priority (4.51%) Happiness (4.38%)	//
Social	Culture (17.12%)	Peers (9.25%) Ethics (4.48%) Team (4. 05%)	Care (0.92%)
Contextual	Work environment (16.19%)	Workplace environment (5.46%) Learning and growth opportunities (5.61%)	Communication (0.77%) Rewards (1%)

Source: Authors' elaboration.

Drawing on Sundriyal and Kumar's (2014) conceptualization of the three main dimensions of workplace well-being (psychological, social, and contextual), and in line with the extant literature, the analysis demonstrated that these dimensions are not conflicting but are highly interrelated; consequently, they are able to influence workplace well-being at both the subjective and objective level.

The emergence of this inner connection between the three themes is due to the holistic nature of the construct under investigation. Thus, managers who embrace that holistic and integrated approach to well-being tend to develop and enact collaborative initiatives, programs, or actions able to have a positive influence on all three main dimensions of workplace well-being at the individual, team, and organizational levels (Costello, 2020).

This holistic and collective approach to well-being can also mitigate "work-related stress and enhance employees' health, well-being, performance, and the organization's productivity" (Cvenkel and Cvenkel, 2020, p. 162), thereby contributing to the creation of what scholars define as the 'happy productive' (Peccei, 2004; Peccei *et al.*, 2013; Zelenski *et al.*, 2008). The results also demonstrate that managers tend to attach more emphasis to some themes related to workplace well-being.

Focusing on the themes, managers attached more importance to culture than to relationships and values. This is because when managers are optimistic, proactive, future-oriented, and supportive, they tend to place great emphasis and work more on cultural elements. After all, shared practice can develop a strong sense of belonging to the organization, contributing to enhancing the individual and collective sense of general well-being (Williams *et al.*, 2015). This finding is also in line with the ecological approach (McGregor *et al.*, 2003), which considers well-being a holistic concept influenced by the cultural elements that characterize both the external and internal corporate environment. In this vein, Yamaguchi and Kim (2015) considered culture as being able to develop tailored ways to approach and contribute to well-being based on managers' ability to inspire their decision-making process to the local/national culture, which offers individuals the same approach to life, to what is good and what is not, and even to problem-solving (Alagaraja, 2020). It follows that managers' understanding of culture and social behaviors can better challenge the complex dynamics that characterize professional relationships that bond people in a specific work environment (Yamaguchi and Kim, 2015). In doing so, managers will be open to addressing not only the situational factors that affect employees' relationships with their work but also the personal factors (e.g., work-life interconnection and balance) that can contribute to creating a positive and stressless experience at work (Cvenkel, 2021). This sheds light on another important theme that emerged from the conducted analysis: workplace well-being can help enhance or make more evident personal traits or individual characteristics. These traits are a person's characteristics that are reflected in psychological capital, namely hope and self-efficacy. Personal traits can influence the way people experience the workplace, their responsibility, stress, and a general sense of wellness, and, in doing so, "their intentions to remain with the organization" (Groza & Groza, 2022, p. 353). A positive work experience can also be influenced by those practices that an organization implements to promote individual well-being, an overall sense of satisfaction, enhanced performance, and productivity. This can be achieved by promoting the work-life balance based on initiatives like dependent care, flexible work options, and family or personal leave (Cosimato *et al.*, 2021; Nunes and Rodriguez, 2024). It follows that managers who want to contribute to creating a positive, shared, and long-lasting sense of well-being pay more attention to individual characteristics and traits than to professional development and personal growth. This is due to the strong influence that personal traits can have on the workplace climate, and therefore on the stress rate, fairness, and inclusiveness (Cvenkel, 2021). Consequently, in making decisions about team building, job/responsibility assignments, and even project management, managers tend to pay more attention to individuals' psychological characteristics than to individuals' ability, skills, and even talent, because these characteristics can negatively affect work life and the ability to hit corporate goals.

The third most recurrent theme was work environment, which mostly attracted managers' interest, especially if compared with organizational features and material achievement. This finding is in line with the extant literature according to which employees' satisfaction and subsequent general well-being can depend on the working space's main characteristics (Aryanti *et al.*, 2020). Thus, recent phenomena, such as demographic changes, "an aging population, longer working hours, competing demands between work and home, and the use of communications technology that works toward 24/7 constant contact" (Cvenkel, 2021, p .431), have had some negative consequences on people's satisfaction with the workplace that highly affect individual and organizational outcomes. Moreover, workplace well-being positively or negatively influences employees' ability to develop professionally (Correa *et al.*, 2019). When managers make employees feel supported, those employees are more open to contributing to creating a positive work environment based on "the collective well-being of departments, teams, and the whole organization as well" (Alagaraja, 2020, p. 13). The attention that managers give to the workplace environment also denotes their efforts in solving quickly and positively emerging problems, making more than the best decision that fits with the specific workplace, the related culture, and the people who contribute to its development. According to Braverman (1999), managers should always be able and willing to avoid their work environment turning toxic, causing personal stress, mistrustful relationships, unrelenting organizational changes, and even bullish or violent behaviors that hinder a company from healthy growth over time (Martin *et al.*, 2003).

Drawing on previous considerations, it is also possible to address the second research question at the core of this study: how does a perceived sense of well-being affect managers' approach to the decision-making process? When managers approach well-being holistically, boosting the synergies existing among its multiple dimensions, the relative managerial decisions are logically influenced. Accordingly, the overall decision-making process is boosted and informed by ethical decisions because it is oriented to fairness, collaboration, motivation, and readiness to change (Nair *et al.*, 2019). Thus, the extant literature approaches fairness as being related to employees' perception of the decision-making process in terms of impartiality and managerial support (Leiter and Maslach, 2017), while collaboration is about the "quality of social interaction at work, including relationships with colleagues, managers, and subordinates" (Cvenkel, 2021, p. 433). Finally, motivation deals with how an organization's priorities and ethical approach are aligned with those of employees (Cho *et al.*, 2008). When fairness, collaboration, and motivation are recognized in organizational governance, employees tend to achieve a high person-job match, which makes them less likely to experience burnout and have turnover intentions, and more open to being deeply engaged in organizational choices even when these require a big change. Moreover, managers who recognize the influence of personal traits on well-being tend also to be open to the influence that these levels of psychological well-being have on the decisions they are called to take in terms of managing team dynamics, essential to ensuring collaboration, commitment to the company, and engagement with corporate activities. This is also important in inspiring managers to make ethical decisions, especially, as stated, when the work environment is becoming toxic, to promptly enact corrective and participative actions to discourage misconduct and violent behaviors (Costello, 2020). It follows that to challenge these situations, managers should inform decision-making on shared purposes, making the related strategies and processes as participative and as smooth as possible. However, it is worth noting that this is possible when managers have themselves developed a sensitive approach to an organization nourished by a generally positive sense of well-being (Day and Penney, 2017).

6. Implications, limitations, and further research

Drawing on the inner complexity of the main construct of well-being, the main aim of this study was to offer a better understanding of the multidimensional and multilevel nature of workplace well-being and to ascertain if and how it affects the decision-making process.

In doing so, the analysis has pointed out some theoretical and managerial insights. The results therefore contribute to the fragmented research on well-being complexity (Dooris *et al.*, 2018), offering a better understanding of the mutual relationships and the synergistic dynamics existing between the different levels (subjective/internal and objective/external) and dimensions (psychological, social, and contextual) at the core of workplace well-being (Sundriyal and Kumar, 2014). By addressing these interconnections, the study sheds light on the intricate interplay of factors that collectively shape well-being. The analysis has pointed out not only the main determinants of the three main dimensions of workplace well-being, but also the dynamic balance between different but strictly related elements that mutually contribute to creating a general sense of well-being at the individual and organizational levels (Dodge *et al.*, 2012). This balance underscores the complex and reciprocal contributions of individual and organizational factors in fostering a holistic sense of well-being. Moreover, the study has demonstrated the theoretical relevance of considering managers' perspective in understanding well-being, highlighting their key role as both influencers and recipients of workplace dynamics.

This offers interesting managerial implications. The results of the analysis demonstrate that managers and their practice can positively affect workplace well-being only when the afore-mentioned dynamic balance between a personal sense of well-being and a sense of well-being felt by other human resources at the psychological, social, and contextual levels is accomplished. In this sense, this work offers some interesting insights that can inspire and support managers in terms of attitude, strategic behavior, and operation practice, essential to finding the most fitting combination of the elements associated with well-being dimensions (Alagaraja, 2020). As the findings demonstrate, this is particularly important in current workplace settings, where unexpected complexities and criticalities contribute to making well-being a multi-faceted and dynamic concept, whose most prominent dimensions are highly dependent on the organizational culture, social interactions, and the ability to balance work-life practices and priorities. To achieve this goal, managers should change their traditional approaches to decision-making, opening up to a participatory logic based on worker-centered data-driven processes and activities. This also offers another interesting and surprising implication for managers, who must be aware that the combination to achieve and nourish workplace well-being does not exist; rather, managers should be ready to change and renegotiate the elements to be considered according to the changing situations that characterize life at the individual, social, and business levels. This implies a lean and smooth approach to decision-making that can be enacted only when managers are proactive, participative, collaborative, and sensitive to challenges and opportunities (Bartels *et al.*, 2019). It is worth noting that this is not an easy task to accomplish; thus, managers must usually discern between multiple and often conflicting priorities (such as critical needs, internal conflicts, misbehaviors, etc.), and take the most suitable decision for employees and for the company only when they are satisfied with their workplace on different levels (Alatartseva *et al.*, 2015). This implies that due to the complexity of workplace well-being, the decisions that managers are called to make are informed not only by rational factors but also by the blurred nature of psychological and social factors. In this sense, a new and more emotion-based approach to decision-making emerges, focusing on the importance of nourishing not only professional and technical competencies but also emotional ones, essential to understanding and reacting to the complex behavioral dynamics that employees enact to face the emergent and unexpected issues typical of current turbulent professional and personal environments. As the findings demonstrate, when managers merge the rational dimension of their professional skills and their emotional abilities, they can easily, proactively, and collaboratively improve workplace well-being, which tends to have a positive indirect influence on employees' satisfaction with their job and their performance.

In a nutshell, the originality of this work makes it possible to assume that perceived well-being can positively affect decision-making when it is holistically approached and therefore achieved by balancing its different dimensions and the related intertwined levels.

The study presents a main limitation related to the investigation of an extreme case study, which does not allow consistent generalization of the results. Nevertheless, the paper proposes exploratory research that is a first qualitative step toward addressing future quantitative studies that could analyze the statistical relationships among well-being dimensions and the decision-making process mediated by the sub-dimensions (themes) detected in this study. Moreover, given the period included in this study, longitudinal studies could be insightful to understanding how well-being, in its multidimensional nature, has developed over the years, particularly considering disruptive events such as economic crises, ecological disasters, technology disruption, and so on. Since this study is based on the collection of reviews, future research could gather data through surveys and then collect primary data.

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Appendix A

Categories	Themes	Sub-themes	% of the total occurrences
Psychological Dimension 35.99	Personal Traits (16.07)	Life Priority	4.51%
		Flexibility	2.20%
		Supportiveness	2.56%
		Happiness	4.38%
		Self-efficacy	2.42%
	Professional Development (14.4)	Career Development	5.35%
		Skills	1.45%
		Learning	6.41%
		Talent	1.19%
	Personal Growth (5.52)	Self-achievement	1.68%
		Success	1.51%
		Expectations	1.26%
		Goals	1.07%
Social Dimension 31.96	Culture (17.12)	Peers	9.25%
		Community	3.90%
		Networking	3.97%
	Relationships (7.08)	Team	4.05%
		Collaboration	2.11%
		Care	0.92%
	Values (7.76)	Diversity	1.15%
		Collective identity	2.13%
		Ethics	4.48%
Contextual Dimension 32.05	Work environment (16.19)	Learning and Growth Opportunities	5.61%
		Workplace Environment	5.46%
		Remote	2.73%
		Agile	2.39%
	Organizational features (8.69)	Innovation	1.34%
		Technology	1.42%
		Leadership	2.73%
		Training	1.19%
		Inclusivity	1.24%
		Communication	0.77%
	Material achievements (7.17)	Upgrading	1.13%
		Rewards	1.00%
		Benefits	3.33%
		Compensation	1.71%

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Factors influencing adoption of digital technologies in agrifood sector. A literature review and research agenda[1]

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Abstract

Framing of the research: *The research focuses on the factors influencing the adoption of enabling technologies in the agri-food sector. Through a systematic literature review, in which 58 papers were analyzed, the study proposes a classification of factors by investigating their impact on adoption intent. Furthermore, by emphasizing the framework of technology adoption, the study considers institutional support, managerial skills, financial resources, and regulatory frameworks as key elements shaping decision-making in agribusiness.*

Purpose of the paper: *The purpose of this paper is to explore the factors that affect the spread of enabling technologies in agri-food sector. Factors affecting companies' technologies adoption are individually investigated and clustered by conceptual groups. Then, their positive or negative effects on the adoption tendency of enterprises technologies were investigated.*

Methodology*: This research is based on a systematic literature review, considering a range of online database from 2012 to 2024. Specific filters have been applied, resulting in a final database that consists of 58 articles. After reading the articles, variables were classified according to social, economic, environmental, and technical nature. Finally, their positive or negative effects on technology purchase intention were investigated.*

Findings*: The research showed that "social factors" are more prevalent than "technical", "economic" and "environmental" factors. Moreover, there is arguably a clear need to improve specific technical and managerial competences about advanced technologies, even by stimulating entrepreneurs to train themselves social, not relying on the experience of others.*

Research limits: *The literature review was limited to articles in English, excluding studies in other languages that could offer significant contributions. Additionally, the selection of empirical studies was confined to the fields of "Business, Management and Accounting, " and Engineering, limiting the scope of the analysis. Lastly, our methodology for evaluating the influence of factors was subjective, based on the interpretation of textual content, with a potential risk of bias.*

Practical implications: *In light of the presented framework, we propose theoretical and managerial implications that would be useful for researchers and practitioners; a research agenda has been provided as well.*

Originality of the paper: *This paper aims to provide an increased understanding of the current state of research and what still needs to be investigated about the* *adoption of technologies in agri-food sector. Our study offers an integrative conceptual framework where factors affecting the adoption of technologies in agri-food sector are individually investigated and clustered by conceptual groups, as well as analysed in terms of impact generated.*

Key words: *Agri 4.0, digital transformation, purchase intention, intention to adopt, systematic literature review.*

1. Introduction

The adoption of cutting-edge technologies in industries signals a change in how businesses operate and create value prompting companies to reconsider the processes that contribute to their success. This shift, as seen in the works of Bagnoli *et al.* (2019) and Toniolo *et al.* (2020) and others represents a revolution that leads to competitive environments as highlighted by Mariani and Fosso Wamba (2020) and Sjödin *et al.* (2020). This transition towards advanced technological adoption has encouraged organisations to enhance sustainability, quality, and transparency in their practices, an approach strongly advocated by Quattrociocchi *et al.* (2022a). Specifically, the agricultural and food industry is at the forefront of this transformation, where the implementation of Industry 4.0 technologies addresses issues like product traceability, food safety and prevention of fraud. This is moreover evidenced by the FAO's objectives of enhancing food security, promoting sustainable agricultural practices, and mitigating environmental impacts through innovation (FAO, 2020). Similarly, they support the European Commission's Agenda 2030, which prioritises the digitalization of agriculture and the adoption of sustainable practices aimed at reducing greenhouse gas emissions, in accordance with EU regulations (United Nations, 2015). Given the agricultural sector's substantial contribution to greenhouse gas emissions, the implementation of frameworks such as the EU Effort Sharing Decision (ESD) and Effort Sharing Regulation (ESR) plays a crucial role in addressing these challenges. In this scenario, Agriculture 4.0 (even Agri 4.0) is being developed, also known as "digital agriculture", "smart agriculture", "smart farming", or "digital farming" (Giua *et al.*, 2022; Engås *et al.*, 2023; Dayioglu and Turker, 2021; Fielke *et al.* 2020). This phenomenon consists of a development form based on resource optimization and logics with the aim of increasing the quality of processes (Gong and Ribiere, 2021) and reducing waste (Benyam *et al.*, 2021). Under this umbrella, it was shown that by applying technologies such as artificial intelligence (AI), blockchain, drones, augmented and virtual reality, companies are facilitated in offering digitised value-added services (Scuderi *et al.*, 2020; Abbasi *et al.*, 2022). It is expected that, by 2050, the demand for food will surge by 70%, in line with rapid population growth. Furthermore, the adoption of digital technologies within the agrifood sector is expected to generate significant environmental and operational benefits, as observed by Secinaro *et al.* (2022) and Rana *et al.* (2021), who underscore the sector's increased accountability and responsiveness to consumer demands. This leads to an increasing awareness that the adoption of enabling technologies has become a necessity, both from a sustainable and competitive perspective (Appio *et al.*, 2021; Scuderi *et al.*, 2020; Trivelli *et al.*, 2019). Despite this, the agrifood sector still presents a low rate of technological investment compared to other sectors and it is considered as a sector with reduced capacity for self-innovation (Bjerke and Johansson, 2022; Läpple *et al.*, 2015). Contrary to the previous considerations, there are sceptical lines of thought towards the uncontrolled use of digital technologies, as claimed by Rijswijk *et al.* (2021), who literally stated that "Current digital technologies may have several undesirable, unseen and unknown impacts, e. g., emergent effects that only become clear once these technologies are brought into practice". This view is shared by Herrero *et al.* (2021) who argued that "Stand-alone technical solutions are in many instances unlikely to result in exclusively positive effects, and they are unlikely to be implemented quickly because of pushbacks from players wanting to maintain the status quo". At global level, UNEP has similarly underscored the potential risks associated with the deployment of technology, including the unequal distribution of benefits and environmental hazards, should these technologies be implemented without a strong regulatory framework in place (UNEP, 2021). As seen, while existing literature has explored specific aspects of technologies adoption in agri-food sector (Srivetbodee *et al.*, 2021), a comprehensive understanding of the underlying factors influencing this process remains elusive. While certain studies have identified key elements that either promote or hinder the diffusion of enabling technologies (Dal Mas *et al.*, 2023), the overall picture is far from complete. Much of the existing literature conceptualizes technology adoption as a binary decision-either a firm adopts the technology or it does not (Sunding and Zilberman, 2001). However, recent research indicates that this process is more nuanced, representing a dynamic and multifaceted progression shaped by a range of variables that influence different stages of decision-making (Jafarpanah *et al.*, 2020). In particular, factors of a personal, social, and behavioural nature, which have the potential to significantly impact adoption decisions, remain relatively underexplored (Busse *et al.*, 2014; Pathak *et al.*, 2019). Moreover, efforts to classify these influencing factors have thus far yielded inconsistent results. Mazzefoli *et al.* (2022), for example, categorises the factors according to the three pillars of sustainability-environmental, social, and economic-while Bucci *et al.* (2019) employs a broader classification scheme encompassing seven categories, including socioeconomic, agro-ecological, and institutional factors. Similarly, Fadeyi *et al.* (2022) proposes an alternative framework, identifying five principal categories such as farmer characteristics, institutional factors, and financial considerations. Despite these various attempts, no common classification system has been established, nor has there been a comprehensive analysis of how these factors collectively influence the intention to adopt technology. This absence of a unified framework not only limits academic discourse but also complicates the development of effective strategies for fostering technology adoption within the agrifood sector. To close this gap, our paper aims to establish an integrative conceptual framework where factors affecting the adoption of technologies in agri-food sector are individually investigated and clustered by conceptual groups, as well as analysed in terms of impact generated.

In the light of the foregoing, this paper tries to answer the following research questions (RQs):

- RQ1) Which factors are affecting technologies adoption in the agri-food sector and how they can be clustered?
- RQ2) In what terms do these factors influence the technologies intention to adopt?

To answer these RQs, 58 papers published from 2012 to today were considered. From reading the papers, factors influencing technology adoption were investigated and conceptualised by two levels of detail based on a holistic approach. In detail, factors were classified according to the three pillars of sustainability - environmental, social, and economic- as well as the technical factors were considered. Once the factors were clustered, the type of effect - positive or negative - they generate on enterprises' technologies intention to adopt were investigated. This paper addresses the urgent need for a coherent framework that elucidates the factors influencing technology adoption in the agrifood sector, providing a foundation for future research and practical strategies to navigate the complexities of digital transformation in agriculture

2. Theoretical background

2.1 Digitalization in agri-food sector

The Industry 4.0 paradigm introduces innovation processes characterised by an increasing interconnection between physical, digital, and biological dimensions (Culot *et al.*, 2020). In particular, even the agricultural sector, traditionally linked to processes reluctant to adopt new technologies, has expanded its vision by changing the business model of entire supply chains (Bagnoli *et al.*, 2019; Ruzzante *et al.*, 2021). In fact, Industry 4.0 enabling technologies such as cloud, additive manufacturing, simulation, augmented reality, big data and analytics, autonomous robots, IoT, vertical and horizontal integration and cybersecurity (Boston Consulting Group, 2015) have become a highly relevant topic for agricultural sectors. Its potential is increasingly recognized not only by primary producers seeking to enhance efficiency and sustainability within their operations, but also by stakeholders throughout the agro-food supply chain. The benefits of data collection in the field, and more broadly within agricultural enterprises, are becoming more apparent, providing more accurate and detailed information for improving traceability throughout the supply chain, enhancing the quality and use of production inputs, and optimising processes for greater efficiency and precision (Lezoche *et al.*, 2020; Liu *et al.*, 2021; Antolini *et al.*, 2015). Literature has also demonstrated the effects derived from the applications of these technologies in the agricultural sector. For instance, several publications agreed that Internet of Things (IoT) stands out as a key turning point for productivity and sustainability in the agrifood system, due to its ability to connect devices and collect data that enhance operational efficiency (Mazzefoli *et al.*, 2022; Oztemel and Gursev, 2020). Trivelli *et al.* (2019) emphasised that big data and data analytics (Wamba *et al.*, 2020) are crucial for a more efficient and effective evolution of the sector, contributing to the optimal use of resources (Lioutas and Charatsari, 2020). Furthermore, artificial intelligence offers powerful algorithms for performance evaluation and forecasting, promoting a form of smart agriculture aimed at sustainable development (Lezoche *et al.*, 2020). Cloud applications, encompassing both cloud computing and cyber-physical systems (Liu *et al.*, 2020), significantly improve soil condition monitoring and disease detection. Among the most tested technologies are drones, which have demonstrated their ability to sustainably enhance production efficiency through precise soil condition monitoring, early plant disease detection, and real-time weather updates (Quattrociocchi *et al.*, 2022b; Tsouros *et al.*, 2019). Additionally, blockchain applications are emerging (Mercuri *et al.*, 2021), which contribute to improved traceability and transparency of activities within agrifood supply chains. Overall, according to Oztemel and Gursev (2020), control technologies, robotics, and automation are progressively reshaping production processes by automating several operations, thereby allowing human operators to focus on activities that require higher cognitive skills, resulting in reduced labour costs and increased system efficiency

2.2 Adoption of enabling technologies in agri-food businesses

The process of adopting new technologies is often viewed as a journey that begins when an entrepreneur first learns about the innovation and continues until its full integration into their business operations. (Fadeyi *et al.*, 2022). The process of adoption of a new technology is conditioned by organisational and personal factors, such as human behaviour, organisational readiness, and the perceived utility of the technology itself. So far, several models have been developed to understand how and by what the process of technology adoption is influenced. In this scenario, models such as the Technology Acceptance Model (TAM) (Davis, 1989) and the Diffusion of Innovations Theory (Rogers, 2003) have identified key variables, such as perceived ease of use and perceived usefulness of the technology. However, these models demonstrate limitations within the agricultural context, where factors like low risk tolerance and infrastructural barriers, particularly in rural areas, pose significant obstacles (Ugochukwu and Phillips, 2018). Moreover, other models as the Unified Theory of Acceptance Use of Technology (UTAUT) developed by Venkatesh *et al.* (2003), and the Diffusion of Innovations (DOI) (Rogers *et al.*, 2014) have been developed in order to introduce additional variables such as institutional support and facilitating conditions. Despite these advancements, the UTAUT often remains insufficient to address the specific needs of the agri-food sector, which requires a more targeted integration of socio-economic and environmental factors, along with considerations of cooperative dynamics and sustainability (Bayaga and Madimabe, 2024; Blut *et al.*, 2022). Diffusion of Innovations (DOI) emphasises the social and cultural spread of technologies, offering a broader perspective, but it under emphasises individual motivations. In this context, the evolution of models such as TAM2 (Venkatesh and Davis, 2000), TAM3 (Venkatesh and Bala, 2008), and UTAUT2 (Venkatesh *et al.*, 2012) highlights the integration of social, cognitive, and technical factors to better understand technology acceptance. Each model builds on its predecessors by incorporating new determinants, such as social influence and facilitating conditions, thereby enhancing their explanatory power. For instance, UTAUT2 extends these concepts by including elements such as hedonic motivation and price value, which are particularly relevant in broader consumer contexts. In general, these models have been used to investigate the several aspects which affect the adoption of the different technologies, even in the agricultural sector. In coherence, Ugochukwu and Phillips (2018) state that this mindset-shift must be supported by appropriate corporate and government policies as the adoption of new technologies by conservative farmers, especially in developing areas, is particularly demanding and must be managed in an adequate and efficient way. In order to push the adoption process of new technologies by farmers, it is important to set out the effects that derive from (Challa and Tilahun, 2014), even to limit the perception that the entrepreneur has toward the specific technology (Yokamo, 2020). In these terms, several studies highlight that several factors influence the intention to adopt new technologies, such as access to information, financial capacity, adherence to cooperatives and government support also in terms of institutional subsidies (El Fartassi *et al.*, 2023). Obviously, the process of selecting and adopting Industry 4.0 technologies is not without obstacles (Liu *et al.*, 2020) as there is no single technological solution that meets the needs of all business counterparties (Lezoche *et al.*, 2020). Katz (2019) states that lack of digital knowledge and differences in technical skills are the main obstacles to technology adoption. Similarly, low risk appetite, uncertainty, and information asymmetry are limitations to its use (Ugochukwu and Phillips, 2018). In particular, the abovementioned impediments in agriculture are often also due to the size of the farm, the low availability of labour, the difficulties of accessing bank credit and financing, the lack of technological infrastructure and the complexity of the infrastructure itself (Annosi *et al.*, 2020). In contrast, numerous benefits are identified. Among these, it emerges the increase in turnover due to the development of a new product/ service (Kölsch *et al.*, 2017), improve productivity, reduce food safety risks and improve the sustainability of the entire sector (Hassoun *et al.*, 2022; Revathi *et al.*, 2019). Moreover, the implementation of such technologies inevitably influences customer expectations; in fact, the offer of greater customization of services and connected experiences on physical and online channels increases customer discretion, thus increasing the difficulties in defining business strategies. In the context of contemporary scientific research, different methodological approaches have been used to facilitate an in-depth examination of the integration of technological innovations in the digital agricultural sector.

3. Methodology

The analysis was conducted through a systematic literature review (SLR) (Seuring and Gold, 2012) aimed at identifying the determinants influencing the adoption of new technologies in the agri-food sector and assessing their effects on technologies intention to adopt. Through this objective it is expected to fill a gap within the research, as the current literature has not yet identified the nature of the factors influencing farmers' decisions to adopt smart solutions and qualify their effects with respect to technology adoption.

In accordance with the aim of the paper, the search string used for the study consists of three parts; The first includes all the various technology designations and all nine enabling technologies (Boston Consulting Group, 2015), as well as the recognised smart factories technologies (Mazzefoli *et al.*, 2022). The second part of the string includes all the keywords that are generally used in the literature to express adoption intention. The third and final part of the string identifies the different nomenclatures of Agri 4.0.

(("technology") OR ("technologies") OR("innovation technology") OR ("digital transformation") OR ("innovation 4.0") OR ("enabling technology*") OR ("qualifying technology*") OR ("advanced manufacturing solutions") OR ("additive manufacturing") OR ("augmented reality") OR ("simulation") OR ("horizontal integration") OR ("vertical integration") OR ("industrial internet") OR (cloud) OR ("cyber security") OR ("big data") OR ("blockchain") OR ("artificial intelligence") OR ("internet of things") OR ("data mining") OR ("drone") OR ("robots"))

AND (("technology adoption") OR ("technology acceptance") OR ("technology diffusion") OR ("value perception") OR ("purchase intention") OR ("purchasing intention") OR ("potential purchase") OR ("potential choice") OR ("implementation intention") OR ("Implementation behaviour"))

AND (("agri-food") OR ("agri-food 4.0") OR (agrifood) OR (agriculture) OR ("digital agriculture") OR ("smart agriculture") OR ("smart farming") OR ("digital farming").

In a SLR, researchers gather the best instances of previous research to identify, evaluate, and interpret all available studies related to a specific topic (Kitchenham and Charters, 2007). This SLR was conducted according to the PRISMA approach (preferred reporting items for systematic review and meta-analysis) which provides clarity and transparency (Moher *et al.*, 2015) and has been depicted in Fig. 1. To ensure quality and extract all relevant articles, two search engines Scopus and Web on Science (WoS) were used as these are the two bibliographic databases generally accepted as the most comprehensive data sources for various purposes (Zhu and Liu, 2020). However, the usability of data sources may also depend to a large extent on the additional restrictions on content accessibility and the willingness to download and export data, affecting research in accuracy (Pranckutė R., 2021). The string was primarily launched simultaneously in the two databases on 1 November 2022 and re-launched on 21 March 2023, 6 October 2023 and 12 April 2024. The first search without the application of database filters resulted in 1608 articles from Scopus and 2101 articles from WoS. At this stage, following the principles of PRISMA, the goal was to identify relevant publications and apply a practical scheme.

In this SLR, the following filter criteria were used:

- Language: English

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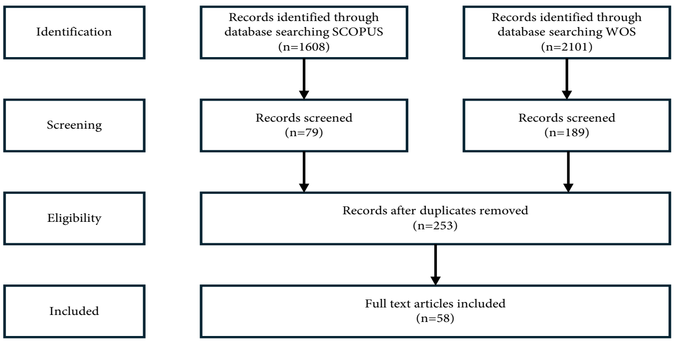
- Document type: article
- Research type: journal
- Research area: Business, Management and Accounting, Engineering
- Timespan: 2012-2024

The following filters reduced the number of articles: in WoS only 189 articles while in Scopus 79 articles, including 15 pooled articles, resulting in a final dataset of 253 articles. This is the usual procedure for systematic reviews, as this process acts as a quality control mechanism that confirms the transparency of the result (Light & Pillemer, 1984). The second phase aimed at reading the abstract and selecting papers that analysed a specific technology through empirical analysis. In particular, several studies were discarded because they focused on technical aspects of the technologies, such as protocols or standards specific to each type of culture and therefore outside the focus of the research (Arasti *et al.*, 2022). A screening of the full text of these articles was carried out in the final phase (Tranfield *et al.*, 2003). To proceed with further analysis, including the valuation of quality and originality, were selected for further analysis because they were found to be closely related to the topic of this review, the following assessments were carried out by the researchers independently and in parallel, and, where doubts arose, they were discussed and resolved (Xiao and Watson, 2017). The articles excluded during the eligibility phase were omitted because they only superficially touched upon the key topics of technology adoption and innovation in the agri-food sector. By the end of the systematic review, only the studies directly addressing the research objectives were selected for deeper analysis. In the final stage, a content analysis was employed to answer the research questions. This process involved systematically coding each study's data into broader themes before analysing the prevalence and importance of those themes (Dixon-Woods *et al.*, 2005). Abstracts were initially screened, followed by a comprehensive review of the full texts to extract relevant information. As highlighted by Kraus *et al.* (2022), qualitative researchers often use content or thematic analysis to categorise data, identifying recurring patterns and organising them into coherent themes for further exploration. This method allows for a more nuanced understanding of the research topic and ensures a structured approach to data interpretation.

Fig. 1: Prisma Flow Diagram



Source: our elaboration

As a result, the final database consisted of 58 articles, which are listed and marked in the bibliography with an asterisk at the end of the citations. The entire categorization of the variables was developed on an Excel file shared between the authors, divided into eight columns, respectively divided as follows: authors, year, extrapolated variables, nature of the variable, positive or negative effect of the variable on the farmer's or farm's intention to adopt, state and Research Agenda. In the final session, any uncertainties were discussed to ensure consistency, and the final classification was proposed. All authors collaboratively reviewed the analysis results and jointly contributed to drafting the various sections of this study. The technological adoption process in the agrifood sector is a complex and multifaceted phenomenon, influenced by numerous factors that can either promote or impede the adoption of innovations. For an in-depth understanding of these dynamics, theories on the diffusion of innovation have been extensively applied since the 1970s. These theoretical models provide a framework for analysing how farmers adopt new technologies, which include equipment, genetic materials, cultivation techniques, and productive inputs, as illustrated by Ruzzante *et al.* (2021). Further examination of technological adoption in the sector is presented in studies by Gao *et al.* (2024) and Jeong *et al.* (2021), which highlight the critical role of technological compatibility in shaping farmers' attitudes towards innovations. Yang *et al.* (2023) have pointed out how technological compatibility can directly influence users' intentions and attitudes towards adopting or embracing a specific technology. Hanelt *et al.* (2021) have further enriched this field of study by investigating the factors that hinder or facilitate technological adoption through a detailed content analysis of selected works. In this study, we have employed a methodology that classifies influencing factors based on the three pillars of sustainability: environmental, social, and economic, with an additional category dedicated to technical variables. This approach, inspired by but distinct from Elkington's (1997) model, incorporates specific technical variables pertinent to the agrifood sector. This schema enables the categorization of factors based on their impact on the intention to adopt technologies, promoting a holistic analysis that considers the interdependencies among the different dimensions. The analysis conducted has led to the standardisation of terms used to describe similar variables, unifying the nomenclature to enhance the coherence and precision of the study. This significantly contributes to the evolution of the existing theoretical framework, marking one of the first attempts to categorise and analyse so comprehensively the factors influencing technological adoption in a business context. The content analysis has delineated the impact of the selected factors, assigning a positive or negative impact, and has laid the groundwork for a future research agenda that could explore further dimensions and interactions within the proposed theoretical framework.

4. Results

This section is divided into two subsections. The first one shows the analytical results based on the literature review, while the second subsection presents the different types of factors influencing the adoption of technologies by enterprises operating in the agri-food sector where variables were identified according to their economic, social, technical and environmental nature.

Factors impacting technologies purchase intention

The analysis conducted shows that purchase intentions towards new technologies in the agri-food sector are strongly dependent on various factors, in particular on the confidence one has towards certain variables. It highlights a predominance of social and economic variables, which demonstrates that decisions are influenced by several factors including demographic, socio-economic and institutional factors (Zegeye *et al.*, 2022). It is necessary to point out that these percentages analyse, in absolute terms, the number of variables belonging to each cluster. This paragraph also highlights whether factors have a positive or negative effect on the enterprises' intentions to adopt new technologies. The following subparagraphs highlight the research results.

Social factors - Social factors play a pivotal role in shaping technology adoption, accounting for 43% of the total factors considered (Table 1). Age emerges as a significant determinant within this group, with numerous studies (Branca *et al.*, 2022; Kramer *et al.*, 2021; Bucci *et al.*, 2019; Antolini *et al.*, 2015) demonstrating that older farmers tend to be less inclined to invest in medium- to long-term initiatives. This reluctance is often attributed to their resistance to external recommendations, particularly when such advice originates from unfamiliar or untrusted sources (Läpple *et al.*, 2016; Manda *et al.,* 2020). Furthermore, despite possessing considerable work experience, older farmers often have lower levels of formal education, which contributes to their hesitation toward new technological investments (Kramer *et al.*, 2021; Adams and Jumpah, 2021). Social networks, including participation in cooperatives or business clusters, also play an essential role in technology adoption by facilitating knowledge dissemination and resource sharing (Blash *et al.*, 2022; Manda *et al.*, 2020). These networks effectively improve farmers' access to critical information and resources, thereby enhancing the likelihood of technology uptake (El Fartassi *et al.*, 2023). Nevertheless, the perceived complexity of managing new technologies, especially concerning data management, can present a significant barrier (Annosi *et al.*, 2020). This is particularly true when farmers lack sufficient information or face technical and financial asymmetries, which further hinder their ability to adopt new technologies (Gerli *et al.*, 2022; Barham *et al.*, 2018). Gender differences add an additional layer of complexity to the adoption landscape. Studies indicate that women, particularly in Australia, are more likely to adopt new technologies compared to men (Hay and Pearce, 2014). However, gender marginalisation and language barriers continue to act as substantial impediments to technology adoption in various regions (Annosi *et al.*, 2020; Fadeyi *et al.*, 2021). Addressing these challenges necessitates fostering collaborative mechanisms, such as cooperative structures, which can mitigate these barriers and support broader technology adoption (El Fartassi *et al.*, 2023; Adams and Jumpah, 2021). Thus, collective effort and structured collaboration are vital to overcoming social constraints and ensuring more equitable and widespread technology adoption in the agricultural sector.

Tab. 1: Social factors

FACTORS	EFFECTS	REFERENCES
High Educational status	Positive	Branca *et al.*, 2022; Khan *et al.*, 2022; Fadeyi *et al.*, 2021;Yokamo *et al.*, 2020; Manda *et al.*, 2020; Skevas and Kalaitzandonakes, 2020; Annosi *et al.*, 2019; Mottaleb *et al.*, 2018; Aubert et al, 2012; Zegeye *et al.*, 2022;Giuia *et al.*, 2022; Swinnen, J and Kuijpers, R, 2019; Blasch *et al.*, 2022; Jellason *et al.*, 2021; Adams and Jumpah, 2021; Bjerke andJohanssen, 2022; Bucci *et al.*, 2019; Eze *et al.*, 2018; Antolini *et al.*, 2015; Pierpaoli *et al.*, 2013
Young age	Positive	Giua *et al.*, 2022; Branca *et al.*, 2022; Annosi *et al.*, 2019; Skevas and Kalaitzandonakes, 2020; Manda *et al.*, 2020; Khan *et al.*, 2022; ;Giuia *et al.*, 2022; Fadeyi *et al.*, 2021 Mottaleb, 2018; Aubert *et al.*, 2012; Kramer *et al.*, 2021; Janssen and Swinnen, 2019; Zegeye, *et al.*, 2022; Barham *et al.*, 2018; Blasch *et al.*, 2022; Jellason *et al.*, 2021; Adams and Jumpah, 2021; Bjerke and Johanssen, 2022; Bucci *et al.*, 2019 Läpple *et al.*, 2016.; Antolini *et al.*, 2015
Membership in cooperatives	Positive	Adams and Jumpah, 2021; Manda *et al.*, 2020; El Fartassi *et al.*, 2023
Large family size	Positive	Manda *et al.*, 2020; Mottaleb *et al.*, 2018; Zegeye *et al.*, 2022; Giuia *et al.*, 2022; Adams and Jumpah, 2021; Fadeyi *et al.*, 2021; Yokamo, 2020
Perception of difficulty	Negative	Giua *et al.*, 2022; Annosi *et al.*, 2020
Experiences	Positive	Annosi *et al.*, 2019; Kramer *et al.*, 2021; Blasch *et al.*, 2022; Adams and Jumpah 2021; Bjerke and Johansson, 2022
Knowledge sharing	Positive	Blash *et al.*, 2022
Ease of use	Positive	Giua *et al.*, 2022; Aubert *et al.*, 2012; Tsai *et al.*, 2021
Access to information	Positive	Branca *et al.*, 2022; Gerli *et al.*, 2022; Yokamo, 2020; Barham *et al.*, 2018; Adams and Jumpah, 2021; Fadeyi *et al.*, 2021; Kathage *et al.*, 2015 Antolini *et al.*, 2015; Pierpaoli *et al.*, 2013
Information asymmetries	Negative	Long *et al.*, 2019; Thomas *et al.*, 2023
Women Gender	Positive	Khan *et al.*, 2022; Zegeye *et al.*, 2022; Skevas and Kalaitzandonakes., 2020; Barham *et al.*, 2018; Hay and Pearce, 2014
Language marginalization	Negative	Annosi *et al.*, 2020
Social influence	Positive	Giua *et al.*, 2022; Manda *et al.*, 2020; Bucci *et al.*, 2019; Srivetbodee and Igel, 2021

Source: our elaboration

Economic factors - The second group relates to economic factors, which include all variables that affect firms' competitiveness, including institutional and infrastructural ones. This category accounts for 35 % of the total amount. Table 2 shows that most of the authors identify the cost of investment as one of the main factors that impacts on purchase intention to adopt technologies (Kebebe, 2019; Mottaleb, 2018; Blasch *et al.*, 2022; Bergougui *et al.*, 2024). In this regard, Annosi *et al.* (2019) pointed out that decision makers should focus on the long-term benefits of applying technologies in the agr-ifood sector, especially in relation to cost and investment decisions. Indeed, awareness as well as expectation of economic return play a key role in the digital transformation process and in defining capabilities (Burkitbayeva *et al.,* 2020). In addition to the cost,

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among the main adoption barriers are the infrastructure improvements (Lele and Goswami, 2017; Pivoto *et al.*, 2018; Iovlev et al, 2019; Zaytsev, 2020), difficulties in acquiring technologies abroad, limited access to credit (Yokamo *et al.*, 2020; Yang *et al.*, 2018) and company size (Adams and Jumpah, 2021). Several papers emphasise a greater propensity of large firms to invest in innovation and R&D as a consequence of their greatest economic resources (Bjerke and Johansson, 2022; Mercuri *et al.*, 2021). On the other hand, a study of Ayenew *et al.* (2020) highlights examples of small-medium companies which, due to their flexibility, demonstrate high market adaptability. Several authors agree that another factor is the uncertainty of economic return involved in the technological investment made (Burkitbayeva *et al.*, 2020; Swinnen and Kuijpers, 2019). The choice of investment should be made based on objective parameters related to technology; for instance, the adoption of systems capable of handling big data enables the detection of optimal quantities for the production line through historical production parameters, thereby reducing the time of production (Cubric, 2020) and the cost of launching new products (Hassoun *et al.*, 2022).

Tab. 2: Economic factors

FACTORS	EFFECTS	REFERENCES
High Cost	Negative	Bergougui *et al.*, 2024; Manda *et al.*, 2020; Cubric, 2020; Kudryavtseva and Skhvediani, 2020;Skevas and Kalaitzandonakes, 2020;Kebebe *et al.*, 2019; Mottaleb, 2018; Blasch *et al.*, 2022;Jellason *et al.*, 2021; Fadeyi *et al.*, 2021; Antolini *et al.*, 2015
Uncertainty economic return	Negative	Burkitbayeva *et al.*, 2020; Skevas and Kalaitzandonakes, 2020, Janssen and Swinnen, 2019
Infrastructure improvements	Positive	Lele and Goswami, 2017; Pivoto *et al.*, 2018; Iovlev et al, 2019; Zaytsev *et al.*, 2020; Kudryavtseva and Skhvediani, 2020; Omotilewa *et al.*, 2019
Access to credit	Positive	Branca *et al.*, 2022; Manda *et al.*, 2020; Burkitbayeva *et al.*, 2020; Branca *et al.*, 2022; Kebebe, 2019; Janssen and Swinnen, 2019; Zegeye *et al.*, 2022; Yokamo, 2020; Swinnen and Kuijpers, 2019; Omotilewa *et al.*, 2019
Size area	Positive	Revathi and Sengottuvelan, 2019; Blash J. *et al.*, 2022
Company size	Positive	Khan *et al.*, 2022; Aubert *et al.*, 2012; Janssen and Swinnen, 2019; Bjerke and Johansson, 2022; Mercuri F., 2020; Adams and Jumpah, 2021; Ayenew *et al.*, 2020
Long-term benefits	Negative	Annosi *et al.*, 2019
Expectation of economic return	Positive	Burkitbayeva *et al.*, 2020
Financial availability	Negative	Aubert *et al.*, 2012
High Purchase cost	Negative	Annosi *et al.*, 2020; Young, 2020; Srivetbodee and Igel, 2021
High Installation cost	Negative	Annosi *et al.*, 2020; Omotilewa *et al.*, 2019
High Maintenance cost	Negative	Annosi et al, 2020; Srivetbodee and Igel, 2021
Reducing production time	Positive	Cubric, 2020
High Launch costs	Negative	Hassoun *et al.*, 2023; Srivetbodee and Igel, 2021
Reserach and infrastructure support	Positive	Fadeyi *et al.*, 2021; Bucci *et al.*, 2019
Increased job	Positive	Jellason *et al.*, 2021; Omotilewa *et al.*, 2019

Source: our elaboration

Technical factors - Technical factors account for 17 % of the total variables considered. Table n. 3, Technical factors include the need for managerial skills (Jellason *et al.*, 2021), the technical difficulties in the use (Fadeyi *et al.*, 2021; Bucci *et al.*, 2019; Thomas *et al.*, 2023), the availability of data (Cubric, 2020) and the need for highly qualified personnel who can adapt to new requirements (Kudryavtseva *et al.*, 2020). Micheels and Nolas (2016) state that the outcome resulting from the application of a specific technology, in addition to depending on the functionality of the technology, depends greatly on the skills of the operators who use it. The adoption of innovative technologies, therefore, requires personnel who have adequate technical skills and possess the capabilities to use them (Skevas *et al.*, 2020).

Another determinant factor is the connection to the broadband network or other connections (Eastwood *et al.*, 2017; Pant and Odame, 2017). Moreover, internet connection is often a hindering factor for companies located in rural areas that intend to adopt enabling technologies, as they have an objective starting disadvantage. Quality and Internet Utilization. The quality aspect pertains to farmers' access quality to the Internet. As noted by Abdullah (2015), the broadband connection speed appears to influence the adoption of digital technologies. Additionally, the extent of Internet utilization among farmers serves as an indicator; those who do not engage with the Internet are typically less inclined to adopt Information and Communication Technology (ICT) as well. In addition, proximity to research centres (Kebebe, 2019; Adams and Jumpah, 2021), possession of infrastructure, security (Dutta *et al.*, 2020; Kudryavtseva and Skhvediani, 2020; Thomas *et al.*, 2023), and transparency of movements (Quattrociocchi *et al.*, 2022a) contribute to the adoption of 4.0 technologies. For instance, blockchain technology allows for increased transparency and traceability of information (Ciasullo *et al.*, 2022), as well as contributing to the development and coordination of new sustainable business models (Mercuri *et al.*, 2021).

Endurance time is defined as the duration for which a specific UAV, equipped with its payloads, is able to remain airborne on a single charge. Traditional drones often face restrictions regarding their flight duration, which may prevent farmers from surveying an entire agricultural field in one go (Puppala *et al.*, 2023). Given the scarce presence of versatile Agro-UAVs, it is crucial to promote research and development efforts aimed at creating drones capable of supporting every stage of the harvesting process. Multi-functional drones have the potential to substantially reduce the costs involved in acquiring, operating, and maintaining distinct pieces of equipment. Furthermore, there is a pronounced demand for the development of various tools that can analyze the gathered data and implement automated, timely interventions (Zuo *et al.*, 2021).

Tab. 3: Technical factors

FACTORS	EFFECTS	REFERENCES
Managerial skills	Positive	Jellason *et al.*, 2021
Perceveid usefulness	Positive	Fadeyi *et al.*, 2021; Bucci *et al.*, 2019
Technical competence	Positive	Gerli *et al.*, 2022; Khan *et al.*, 2022; Skevas and Kalaitzandonakes, 2020; Annosi *et al.*, 2019; Micheels and Nolas, 2016
Data availability difficulty	Negative	Cubric, 2020; Thomas *et al.*, 2023
Qualified staff	Positive	Kudryavtseva and Skhvediani, 2020; Annosi *et al.*, 2020
Private agricultural consultant	Positive	Eastwood *et al.*, 2017
Internet access	Positive	Fadeyi *et al.*, 2021; Bucci *et al.*, 2019, Abdullah, 2015; Hay and Pearce, 2014
Research centers	Positive	Kebebe, 2019; Adams *et al.*, 2021
Increased security	Positive	Dutta *et al.*, 2020; Cubric, 2020; Kudryavtseva and Skhvediani, 2020; Ciasullo *et al.*, 2022; Hassoun *et al.*, 2023
Greater trasparency	Positive	Dutta *et al.*, 2020; Dal Mas *et al.*, 2023

Source: our elaboration

Environmental factors - Our results show that environmental factors only account for 4% of the total factors (Table 4). Smart agriculture uses several advanced technologies, including IoT and others among the top nine, to collect data from multiple sources to be able to make decisions associated with various types of production (Thomas *et al.*, 2023; Medici *et al.*, 2019) with the aim of maximising yields but more importantly preserving the environment. The new technologies of Industry 4.0 show several benefits, including energy savings, better environmental performance, higher level of health and safety, and better conditions for workers (Hassoun *et al.*, 2022). Among other uses, in the agricultural stage IoT can improve chemical control such as pesticides and fertilisers, crop monitoring, disease prevention, irrigation control, and soil management (Navarro *et al.*, 2020; Adams and Jumpah, 2021). Thus, the use of 4.0 technologies in agriculture reduces the use of environmental pollutants, bringing atmospheric benefits, as well as improving soil quality and reducing groundwater pollution (Maffezzoli *et al.*, 2022). The current period is also characterised by the scarcity of raw materials, which is why the difference in competitive advantage between companies is especially given by the degree of environmental management of the company. It is therefore necessary to develop production plans that ensure environmentally sustainable production and food security. Cane and Parra (2020) studied how digital technologies can create benefits from both business and consumer perspectives by trying to leverage food waste reduction. In conclusion, academic studies promote the development of green agricultural entrepreneurial activities that integrate sustainable technologies (Savastano *et al.*, 2022).

Tab. 4: Environmental factors

FACTORS	EFFECTS	REFERENCES
Greater sustainability	Positive	Giua *et al.*, 2022; Cubric, 2020; Jellason *et al.*, 2021
Environmental sustainability	Positive	Skevas and Kalaitzandonakes, 2020; Annosi *et al.*, 2019
Energy conservation	Positive	Hassoun *et al.*, 2023
High level of security	Positive	Hassoun *et al.*, 2023
High level of health	Positive	Hassoun *et al.*, 2023; Thomas *et al.*, 2023
Higher soil quality	Positive	Blasch *et al.*, 2022; Adams and Jumpah, 2021; Maffezzoli *et al.*, 2022
Food waste reduction	Positive	Cane and Parra, 2020
Enviromental benefit	Positive	Medici *et al.*, 2019; Antolini *et al.*, 2015

Source: our elaboration

5. Discussion and conclusion

Our paper aimed to identify factors that can influence companies' propensity to adopt new digital technologies in the agrifood sector, classifying them into conceptual groups belonging to four clusters - economic, technical, social and environmental factors (RQ1) - and evaluating their effects on technologies intention to adopt (RQ2). The research thus defines a new theoretical framework through which a clustering of factors was provided; in addition, the factors were further qualified according to their impact on purchase intention of new digital solutions in agri-food sector. In light of this analysis, we can present some deductions; there is a clear need to provide specific technical and managerial competences about enabling technologies, even by stimulating entrepreneurs to train themselves personally, not relying on the experience of others. In this way, by training personnel and providing them appropriate skills, it is possible to integrate new solutions into the business environment with substantial benefits in terms of human-machine interactions. Moreover, there is a need to invest primarily in business structure in order to make access to credit easier. The socio-economic business environment assumes a key role in order to push enterprises toward a cross-cutting digitization process.

6. Theoretical implications

Our paper contributes to the literature through three insights. First, the research provides an update and a new conceptualization of factors influencing technologies' purchase intention in the agrifood sector (RQ1). Specifically, according to the literature, social, technical, economic and environmental factors were identified. Although there is no common classification of factors that influence the adoption of new technologies in the agri-food sector, this research is useful as it provides an updated framework on the several factors that influence the intention to adopt the enabling technologies in the agri-food sector. In particular, the analysis advances theoretical understanding of technology adoption by integrating the three pillars of sustainability-environmental, social, and economic- while also emphasising the role of technical variables, which are especially pertinent in the agrifood sector. Furthermore, this study expands the traditional sustainability framework by incorporating sector-specific technical considerations. This provides a more comprehensive perspective on how these multiple dimensions interact and shape the intention to adopt new technologies. The study thus contributes to bridging the gap between sustainability and technology adoption, fostering a more nuanced theoretical framework that is better suited to address the complexities of modern agricultural practices. Moreover, this paper should be considered useful for academic and practitioners as the -positive or negative- effects of each factor on technologies purchase intention are investigated (RQ2), thus providing an updated framework that enhances understanding of the key factors to target in order to promote technology adoption within the agrifood sector. This comprehensive analysis enables more effective interventions aimed at facilitating the uptake of innovations in this specific context. Lastly, our contribution provides some future research direction in order to deeply investigate customer needs and perceptions, as individuated through the following paragraph. In this term, it has to be highlighted that just a few papers have set a research agenda so far.

7. Managerial implications

This research offers some important implications for managers and policy-makers. In particular, this research can be useful for policy makers to establish policies to encourage the use of new technologies by directing efforts toward public incentive policies with the allocation of public funds throughout the sustainability dimensions: economic, social and environmental. It is highlighted that it becomes useful to direct funds towards the formation of specific technical skills, in order to reduce reluctance to technological and innovative investment. In our opinion, we believe that public initiatives should be planned in order to encourage the entrepreneurial culture towards sustainable business models based on the implementation and sharing of digital technologies in the agrifood sector. Environmentally, implementation of enabling technologies helps to create sustainable business conditions by reducing the polluting effects of production processes (Long *et al.*, 2019). These considerations lead to reconsider the importance of managerial class knowledge, which enables companies to develop long-term investment strategies by not limiting them to the act of purchasing. Specifically, managerial perceptions need to be acted upon, as they do not have full awareness of the positive externalities that result from technological investment since they do not perceive a need for it either from an environmental or technical perspective. Moreover, managers need to rethink their business strategy, basing value creation process on a long-term perspective and rethinking the labour market by a computerisation and digitisation of employees. In general terms, agrifood companies must change the logic that have characterised their business models so far, adopting digital technologies and improving both personal and technical skills throughout the production chain.

8. Limitations and future research directions

Our investigation into the application of technology in the agrifood sector presents several practical limitations that might influence the generalizability and applicability of our conclusions. The primary constraint of our research lies in the selection of sources; our literature review was exclusively confined to scholarly articles published in English. This linguistic restriction potentially omits pivotal studies published in other languages that could offer valuable insights into the topic, thereby narrowing the diversity and scope of our analytical perspective. Secondly, the selection of empirical studies for our factor analysis was constrained to the domains of "Business, Management and Accounting, " and Engineering. This deliberate choice, influenced by the authors' academic specialisations, may have inadvertently narrowed the scope of our analysis, limiting its ability to capture a broader spectrum of factors relevant to the adoption of technology in agriculture. Furthermore, our methodology for assigning a positive or negative influence to various factors was inherently subjective, relying primarily on our interpretation of the textual content of the selected papers. This approach bears the risk of bias and misinterpretation, which could affect the reliability and validity of our findings. The results of our Systematic Literature Review (SLR) indicate that although there is a growing interest in technological innovations within the agrifood sector, the body of research requires significant improvements both qualitatively and quantitatively. From a qualitative standpoint, our review has identified a lack of comprehensive studies that deeply analyse the levels of adoption and awareness of new digital solutions in agriculture. To date, there has been no exhaustive research that systematically evaluates and assigns specific weights to the factors influencing technology adoption within this sector. Moreover, the geographical focus of most empirical studies has been predominantly on developing countries. This geographic bias highlights the necessity for more inclusive research that conducts comparative analyses across different countries with similar agricultural profiles, such as Spain, Italy, and France.

In terms of future research directions, there is a substantial need to explore how different factors vary in their impact on technology adoption and to understand the underlying reasons for these variations. Questions such as how governmental support can affect the adoption rates of technological solutions in agrifood companies or the extent to which financial support from institutions influences purchasing intentions are crucial. Additionally, investigating whether similar research methodologies can be applied across various branches of the industry, including breeding, distribution, and consumption, would provide valuable insights. On a quantitative level, there is a clear pathway for extending the sample size through the development of cross-country studies and conducting comprehensive surveys on the attitudes of managers and entrepreneurs toward the implementation of Agrifood 4.0 solutions, utilising both surveys and interviews. Such studies should aim to encompass a broader array of countries and companies, thereby uncovering additional factors that could influence the success or failure of technology implementations. Moreover, our findings indicate that certain economic agents may prioritise technologies that support economic viability, yet these choices may not always align with environmental goals (Bergougui *et al.*, 2024). Therefore, a deeper investigation into how the scale and focus of technological investments can impact both economic and environmental sustainability is essential, even by investigating how the different agents across the supply chain perceive the trade-offs between technological investment and sustainability objectives. This approach would help identify strategies that balance the dual aims of fostering innovation and ensuring long-term ecological resilience.

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Navigating emotions and identities during the pandemic crises and their effect on organizational citizenship behaviors[1]

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Abstract

Frame of the research: *Organizational citizenship behaviors promote the effective functioning of organizations and become especially relevant during crises and emergencies. Understanding how to elicit these behaviors is essential for effective crisis response. Previous research acknowledges the role of emotions, organizational, and shared social identity in promoting positive employee behaviors. However, the link between identities and how employees manage their emotions during crisis situations, particularly through the surface and deep acting inherent in emotional labor, remains under-explored.*

Purpose of the paper: *The study aims to investigate how emotions, surface and deep acting inherent in emotional labor, organizational identity, and shared social identity influence organizational citizenship behaviors among professionals during crises and emergencies.*

Methodology*: A questionnaire survey was administered to 223 professionals in the province of Bergamo, Italy, during the COVID-19 crisis. Hypotheses were tested through regression and mediation analysis.*

Results*: Results show that positive emotions, deep acting, organizational and shared social identity encourage organizational citizenship behaviors. The effect of deep acting on organizational citizenship behaviors is positively mediated by both organizational and shared social identity.*

Research limitations: *Limitations of the study include potential biases in self-reported data and the specific context analyzed.*

Practical implications: *The study offers managerial insights to foster positive organizational behaviors during crises. Results highlight the importance of increasing the level of identification of employees with the organization and their social group.*

Originality of the paper: *This research contributes to the literature by examining the complex interplay between organizational citizenship behaviors, emotions, emotional labor, organizational and shared social identity, taking the COVID-19 pandemic as an illustrative case of extreme emergency.*

Key words: *organizational citizenship behaviors; emotions; emotional labor; organizational identity; shared social identity; crises management.*

1. Introduction

Modern organizations operate in an environment of constant flux, grappling with unprecedented uncertainty and the need for rapid adaptation (Balzano *et al.*, 2023). From economic downturns and geopolitical crises to pandemics like COVID-19, these disruptions test an organization's resilience (Mahmoud *et al.*, 2024). Human resources play a critical role in navigating situations of crisis and uncertainty, ensuring the organization remains functional and effective (Balzano *et al.*, 2023; Mazzei *et al.*, 2019; Ashfort, 2020). However, uncertainty and crises inevitably generate additional pressures on employees, evoking a spectrum of emotions within them, ranging from anxiety and fear to greater focus and even a sense of excitement, and these emotions significantly impact how individuals behave within the organization during the emergency (Mihalache and Mihalache, 2022; Yu *et al.*, 2021; Wang *et al.*, 2021; Mahmoud *et al.*, 2024). Additionally, emotional labor and in particular deep acting, i.e., the act of managing emotions to align with job demands, becomes especially crucial during crises, significantly impacting organizational behaviors (Lam *et al.*, 2022; Wu *et al.*, 2024).

Despite the growing interest in emotions and emotional labor in shaping organizational behaviors such as organizational citizenship behaviors (OCBs), the role of these variables has often been explored separately, with findings that are frequently contradictory when analyzed in crisis situations (Wang *et al.*, 2021; Chattopadhyay, 2024). This is due to the complex relationships among these factors and the influence of mediating mechanisms such as identity (Chen *et al.*, 2013; Yang and Chen, 2021; Humphrey *et al.*, 2015). Research on crisis situations reveals that identity, defined as a set of meanings that define who a person is (Burke and Stets, 2009), can be diminished by uncertain environments (Ashforth, 2020; Bordia *et al.*, 2004), thereby influencing how employees respond to crises (Ashforth, 2020). However, crises can also create opportunities for identity to emerge stronger and more resilient (Lian *et al.*, 2022; Sun *et al.*, 2023; Kim *et al.*, 2013; Haslam *et al.*, 2021). This, in turn, is associated with positive work outcomes, such as OCBs (Lian *et al.*, 2022). In this context, both organizational identity and shared social identity play a crucial role in shaping employees' responses to crises. Organizational identity refers to the sense of belonging among members of an organization (Cornelissen *et al.*, 2007), while shared social identity is a broader concept that reflects a sense of unity among members of a community facing an emergency or a common fate (Drury, 2018). Both identities have been found to encourage cooperation and positive behaviors, even in crisis situations (Lian *et al.*, 2022; Haslam *et al.*, 2021). However, emotional labor - the process of aligning or failing to align felt emotions with those expected by an organizational role - can either strengthen or weaken one's sense of belonging to both the organization and the community (Humphrey *et al.*, 2015), thereby influencing both organizational and shared social identities.

The gap in understanding the dynamic interrelationships between emotions, emotional labor, and identity in relation to OCBs limits our knowledge of how to effectively leverage these factors to foster positive employee behaviors, especially during challenging times. By identifying key factors that drive employee engagement and OCBs during crises, organizations can effectively navigate challenges (Rizaie *et al.*, 2023; D'Souza *et al.*, 2023) and implement targeted interventions to enhance employee emotional states, foster a collaborative and positive work environment, and ensure continued success in the face of adversity.

This study, focusing on a crisis context, examines the relationship between emotions, emotional labor and OCBs, taking into account organizational identity and shared social identity as mediating mechanisms.

The research is conducted during the COVID-19 pandemic as an illustrative case of a crisis characterized by extreme uncertainty, focusing on healthcare professionals as an example of workers heavily impacted by the challenges created by the pandemic (Rizaie *et al.*, 2023; Leo *et al.*, 2021). Healthcare workers, in fact, had to face a context of intense and unexpected stress (Wang *et al.*, 2021; Rizaie *et al.*, 2023), without having been prepared and without adequate skills and taskforce (Leo *et al.*, 2021). Relying on both tangible and intangible resources available to them as individuals and as members of an organization, they attempted to cope as best they could with a highly unpredictable situation. Through a survey of 223 professionals working in Bergamo, Italy, identified as one of the global epicenters of the pandemic with a seroprevalence rate of 38.5% that far surpasses the figures reported in other severely impacted areas like New York (19.9%), London (17.5%), and Madrid (11.3%) (L'Eco di Bergamo, 2020), this research seeks to provide insights into the mechanisms that drive positive organizational behaviors in times of crisis.

Results show that positive emotions, deep acting, organizational and shared social identity foster employees' OCBs. Moreover, organizational and shared social identity positively mediate the relationship between deep acting and OCBs. The study contributes to the literature on OCBs, by showing that in emergencies, deep acting and a strengthened sense of organizational and social identity can foster higher OCBs by enhancing employees' alignment with both organizational and communal goals. In terms of managerial implications, these findings suggest that managers can play a significant role in promoting OCBs by creating a positive and supportive work environment, encouraging deep acting, and building a strong organizational and shared social identity. The paper is organized as follows: Section 2 provides the theoretical background, Section 3 outlines the methodology, Section 4 presents the findings, Section 5 discusses the results, and Sections 6 and 7 conclude with theoretical contributions and managerial implications, and conclusions, limitations and avenues for future research.

2. Theoretical background

Organizational Citizenship Behaviors (OCBs) are defined as discretionary behaviors that are not directly or explicitly recognized by the formal reward system, and which, in the aggregate, promote the effective functioning of the organization. This concept was initially proposed by Organ in 1988, who described it as those behaviors that, while not mandatory, contribute to the improvement of the social and psychological context of the organization and together promote organizational effectiveness (Organ, 1988).

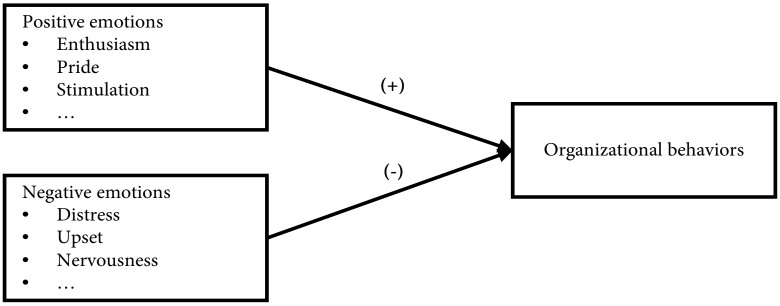
Studies have shown that OCBs facilitate organizational communication, promote organizational planning, improve interpersonal cooperation, and develop a better organizational climate, directly influencing employee satisfaction, quality of work life, service delivery, work commitment, and firm performance (Podsakoff *et al.*, 1997; 2000; 2009; Bolino *et al.*, 2002; Ziegler *et al.*, 2012). At the same time, studies on the healthcare sector reveal that OCBs play a crucial role in promoting patient-centered care, teamwork, patient safety, employee well-being, and organizational performance (Huang *et al.*, 2021; Qiu *et al.*, 2020; Prottas and Nummelin, 2018; Rizaie et al; 2023). Encouraging and recognizing these behaviors among healthcare professionals can contribute to a positive work environment and ultimately enhance patient care quality (Huang *et al.*, 2021; Maier *et al.*, 2018). OCBs are particularly important during crises and emergencies because cooperation, altruism, and work commitment become even more crucial (Yu *et al.*, 2021; Wang *et al.*, 2021; Mazzei *et al.*, 2019). Understanding how to elicit these behaviors during such situations is essential for organizational functioning, sustained employee performance, and ultimately, for effectively coping with the emergency (Rizaie *et al.*, 2023).

Previous research has already investigated drivers of OCBs, and many studies have focused on emotions, emotional labor, and organizational and social identity (e.g., Spector and Fox, 2002; Grandey, 2003; Ashforth and Mael, 1989). Despite this, drivers of OCBs have been explored separately, calling for a focus on their interplay, with particular attention to the role of different identities (Yang and Chen, 2021). Furthermore, studies conducted in emergency contexts have often yielded conflicting results (Wang *et al.*, 2021; Chattopadhyay, 2024). This highlights the importance of focusing on the interplay between emotions, emotional labor, organizational and social identities, and OCBs, particularly within the context of a crisis, building on previous findings in the literature.

2.1 Emotions, emotional labor, and OCBs

Emotions are complex psychological states that involve three distinct components: a subjective experience, a physiological response, and a behavioral or expressive response. According to Fineman (1993), emotions are not just uncontrollable impulses but multifaceted elements that engage various subsystems of human functioning. As Ashforth and Humphrey (1995) and Lord and Kanfer (2002) highlighted, emotions, both positive (e.g. enthusiasm, excitement, interest, inspiration) and negative (e.g. fear, nervousness, shame, stress), are integral to organizational life, shaping interactions and behaviors (see Figure 1).

Fig. 1: Positive and negative emotions



Source: our elaboration

Research suggests that positive moods and emotions lead to prosocial behaviors (Clark and Isen, 1982), including increased helpfulness towards colleagues and customers (George, 1991; George and Brief, 1992), are linked to proactive and creative behaviors (Fredrickson, 2001), increase motivation and engagement (Fredrickson, 2001), enhance problem-solving and creativity, (Isen, 2001) and foster cooperation and teamwork. Furthermore, positive emotions can increase the likelihood of engaging in OCBs, promoting supportive and collaborative behaviors among colleagues (Spector and Fox, 2002; Yu *et al.*, 2021; Ziegler *et al.*, 2012; Huang *et al.*, 2021). Conversely, negative emotions such as frustration, stress, anxiety are often correlated with counterproductive behaviors (Eissa *et al.*, 2020; AL-Abrrow *et al.*, 2020) and lead to dysfunctional behaviors and decreased performance (Fredrickson, 2001). Despite this, contrary to positive emotions, the relationship between negative emotions and OCBs is nuanced. While Spector and Fox (2002) focus on their role in inhibiting the likelihood of engaging in OCBs, George and Zhou (2002) found that in creative organizational environments, negative emotions can drive positive and collaborative behaviors, such as enhanced motivation and proactive problem-solving. In addition, Halbesleben and Bowler (2007) highlighted that negative emotions, particularly exhaustion, may drive individuals to engage in OCBs as a way to develop and maintain social support and interpersonal relationships, thereby helping them cope with exhaustion. Moreover, negative emotions, if combined with positive ones, can generate positive organizational behaviors by enhancing creativity, promoting proactive problem-solving, increasing effort and persistence, facilitating balanced decision-making, and improving team dynamics (George and Zhou, 2007).

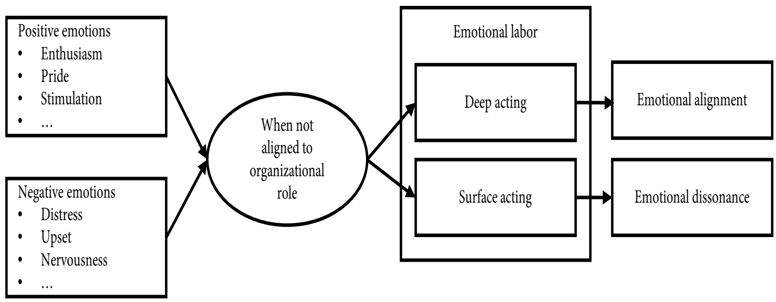
Research on crisis situation and on COVID-19 pandemic highlights that emotions play a crucial role in organizational dynamics. Positive emotions have a positive impact on organizational behaviors (Wang *et al.*, 2021; Mihalache and Mihalache, 2022). Conversely, the effects of negative emotions on OCBs seem to be more complex. In this vein, Mahmoud *et al.* (2024) and Yu *et al.* (2021) outline that negative emotions such as anxiety, fear, and stress adversely affect OCBs, while Wang *et al.* (2021) report an insignificant relationship between the two variables.

Based on the presented literature, the following hypotheses are formulated:
- H1a: In emergency contexts, positive emotions are positively related with organizational citizenship behaviors.
- H1b: In emergency contexts, negative emotions are negatively related with organizational citizenship behaviors.

Emotional labor refers to the management of emotions to conform to organizational expectations regarding emotional expression (Hochschild, 1983). It involves the behavior exhibited by employees when interacting with internal colleagues or external consumers, involving the management of their emotions by restraining or modifying their authentic feelings to align with the expectations of their job roles (Jones, 1998; Diefendorff and Gosserand, 2003).

Scholars have identified two dimensions of emotional labor: surface and deep acting (Grandey, 2003; Chu and Murrmann, 2006; Lee and Madera, 2019). Surface acting involves simulating emotions that are not actually felt and modifying outward appearance without changing internal experience (Grandey, 2003). This practice results in emotional dissonance, which reflects the degree to which an employee's expressed emotions align with his or her true feelings. Deep acting, on the other hand, refers to the practice of attempting to change also internal emotions to align with the required external expression and the need to exert an emotional effort to achieve the right emotion for work (Grandey, 2003) (see Figure 2).

Fig. 2: The relationship between emotions and emotional labor



Source: our elaboration

Emotional labor is increasingly recognized as a genuine skill and competence and is therefore valued, rewarded, and sought after as a job requirement, especially in jobs that rely on interpersonal interaction (Grandey, 2003; Kumar Mishra, 2014; Wu *et al.*, 2024; Humphrey *et al.*, 2015). Several studies have investigated the positive and negative outcomes of emotional labor (Yang and Chen, 2021; Lee and Madera, 2019). Researchers generally agree on the positive effects of deep acting such as good intentions towards organizations, employees' well-being, job satisfaction, and increased productivity (Grandey, 2000; 2003; Humphrey *et al.*, 2015; Lee and Ok, 2012; Kim *et al.*, 2012; Gursoy *et al.*, 2011; Lam *et* *al.*, 2022) and on the negative ones associated to surface acting, such as job stress, emotional exhaustion, burnout (Grandey, 2000; 2003; Humphrey *et al.*, 2015; Lee and Ok, 2012; Kim *et al.*, 2012; Gursoy *et al.*, 2011; Lam *et al.*, 2022).

However, the relationship between the two strategies of emotional labor and OCBs seems more nuanced and complex. While most studies agree on the positive relationship between deep acting and OCBs (Cheung and Lun, 2015; Shagirbasha and Sivakumaran, 2021), the relationship between surface acting and OCBs remains less clear. Cheung and Lun (2015) and Pohl *et al.* (2015) did not find a significant association between the two variables. On the other hand, Shagirbasha and Sivakumaran (2021) found that surface acting negatively affected OCBs. However, their results showed that employees who engage in surface acting can still exhibit high OCBs if they receive high perceived organizational support.

Research on crisis situations, including the COVID-19 pandemic, reveals that emotional labor is particularly crucial in these contexts due to additional workload pressure and work fatigue (Wen *et al.*, 2023; Lam *et al.*, 2022; Wu *et al.*, 2024). At the same time, understanding the relationship between emotional labor and OCBs is particularly complex. Chattopadhyay (2024) found that high levels of emotional labor during the COVID-19 period did not affect OCBs. Conversely, other researchers showed that deep acting is associated with positive outcomes (Wu *et al.*, 2024), and with feelings of meaningful work and enjoyment in working, potentially fostering the well-being of workers (Pace *et al.*, 2022). Relative to surface acting, Yikilmaz *et al.* (2024) found that it intensifies healthcare professionals' experiences of job stress and emotional exhaustion.

Based on the presented literature, the following hypotheses are formulated:

- H2a: In emergency contexts, deep acting is positively related with organizational citizenship behaviors.
- H2b: In emergency contexts, surface acting is negatively related with organizational citizenship behaviors.

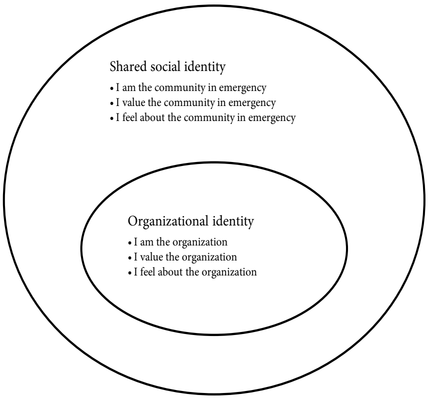
2.2 Organizational identity, shared social identity, and OCBs

In the organizational and management fields, the last three decades have seen organizational identity increasingly move to the center of academic interest, creating a debate that is both fascinating and contested (Alvesson *et al.*, 2008; Coupland and Brown, 2012; Ybema *et al.*, 2009). In a company, organizational identity refers to how members of an organization perceive and identify with it. Albert and Whetten (1985) define organizational identity as the set of central, distinctive, and enduring attributes of an organization shaping what the organization is, how it is different from others, and how it maintains its continuity over time. This identity is crucial for the sense of belonging of organizational members and influences their behavior and commitment (Cornelissen *et al.*, 2007). Ashforth and Mael (1989) argue that a strong organizational identity promotes cooperative and supportive behaviors among members, and is a source of positive employee outcomes (Tarakci *et al.*, 2018) such as motivation and performance (Balzano *et al.*, 2023), improves employee well-being (Nunes *et al.*, 2024), reduces turnover intentions (Chen *et al.*, 2013), and ultimately enhances OCBs (Dutton *et al.*, 1994; Ashforth and Mael, 1989; Newman *et al.*, 2016; Chen *et al.*, 2013).

Research on crisis situation and on COVID-19 pandemic reveals that organizational identity can be reduced by uncertain environment, job insecurity, fear, and anxiety (Ashforth, 2020; Bordia *et al.*, 2004) affecting how employees behave in response to the emergency (Ashforth, 2020) and impacting core values and established practices (Mihalache and Mihalache, 2022). However, crises also present opportunities for organizational identity to emerge stronger and more resilient (Lian *et al.*, 2022; Sun *et al.*, 2023; Kim *et al.* 2013; Haslam *et al.*, 2021). Especially external threats can increase the "organizational we-ness" among employees (Greenaway and Cruwys, 2019), which, in turn, is related to positive work outcomes, such as OCBs (Lian *et al.*, 2022).

Another form of "we-ness" that frequently emerges during crises and emergencies is shared social identity (Drury *et al.*, 2016). While organizational identity is confined to the boundaries of the organization, shared social identity extends beyond it, encompassing the perception of shared values, common goals, and a collective understanding of the context in which group members operate (Cornelissen *et al.*, 2007; Tajfel and Turner, 1986) (see Figure 3).

Fig. 3: Organizational identity and shared social identity



Source: our elaboration

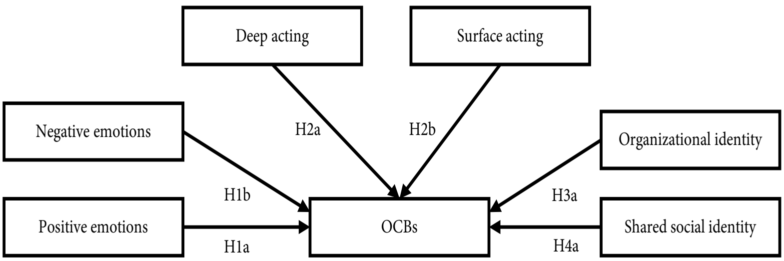
A shared social identity reflects a sense of oneness and perceived similarity among group members who face a common fate in response to an emergency event (Drury, 2012; Drury, 2018). Common fate enhances perception of within-group similarity, regardless of the organization in which each member of the group works. In this case, the boundaries of the group tend to coincide with the entire community that is experiencing the emergency situation. The common experience of threat and danger lead to the development of new and deeper bonds between people with different roles, who, prior to the crisis, did not share values or goals. The categorization into "us" (new in-group) and "them" (new out-group) become central and leads to the formation of an emergent shared social identity (Drury, 2018), which motivates individuals to strengthen social bonds, promote cooperation, mutual support, and shape positive behaviors (Haslam *et al.*, 2009b; Haslam *et al.*, 2021, Tajfel and Turner, 1986).

A strong shared social identity can be seen as the basis for all productive social interaction between people (Haslam *et al.*, 2009b) promoting cohesion, cooperation, helping and trust within the group, enhancing the overall group functioning (Haslam *et al.*, 2009a; Haslam *et al.*, 2001), and coordinating their behavior to achieve common goals (Turner and Haslam, 2014; Haslam *et al.*, 2009a). For these reasons, a strong shared social identity can foster OCBs (Liu and Qi, 2022; Wu *et al.*, 2023; Haslam *et al.*, 2009b).

Based on the literature, the following hypotheses are formulated:
- H3a: In emergency contexts, organizational identity is positively related with organizational citizenship behaviors.
- H4a: In emergency contexts, shared social identity is positively related with organizational citizenship behaviors.

Figure 4 summarizes the first 6 hypotheses formulated so far.

Fig. 4: The linear model



Source: our elaboration

2.3 The mediating role of identity

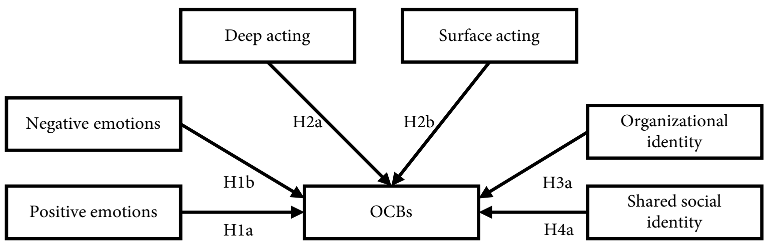
When employees engage in surface acting, they may feel less committed to the organization, and emotional dissonance can reduce their overall attachment to the organization and its goals (Kumar Mishra, 2014; Grandey, 2003), which can, in turn, affect organizational identity. In addition, surface acting can lead to feelings of alienation and disconnection from the group (Humphrey *et al.*, 2015), weakening the connection to shared social identity (Ashforth and Humphrey, 1993). Conversely, employees who engage in deep acting and emotional effort tend to exhibit positive intentions and attachment toward their organizations (Humphrey *et al.*, 2015; Grandey, 2000; 2003). They align their felt emotions with those expected by the organization, fostering a stronger connection and sense of belonging, which ultimately leads to an enhanced organizational identity (Kumar Mishra, 2014). Furthermore, deep acting can also strengthen social bonds with other group members, reinforce shared values within the group (Humphrey *et al.*, 2015) and increase shared social identity (Kumar

Mishra, 2014), especially during emergency situations (Drury, 2018).

Based on the literature, the following hypotheses are formulated (see Figures 5 and 6):

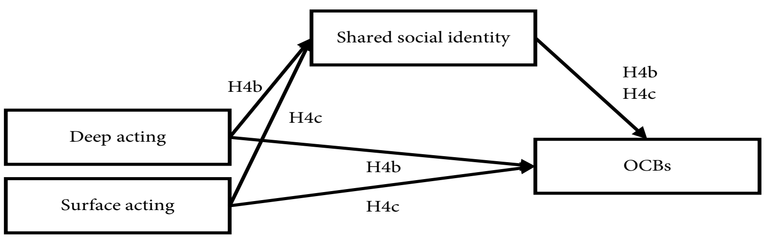
- H3b: In emergency contexts, organizational identity has a mediating role between deep acting and organizational citizenship behaviors.
- H3c: In emergency contexts, organizational identity has a mediating role between surface acting and organizational citizenship behaviors.
- H4b: In emergency contexts, shared social identity has a mediating role between deep acting and organizational citizenship behaviors.
- H4c: In emergency contexts, shared social identity has a mediating role between surface acting and organizational citizenship behaviors.

Fig. 5: Mediation effect of organizational identity



Source: our elaboration

Fig. 6: Mediation effect of shared social identity



Source: our elaboration

3. Method

The study adopts a quantitative research design to examine the relationship between emotions, emotional labor, organizational and social identity, and organizational citizenship behaviors in healthcare professionals during the pandemic crisis.

Participants include healthcare workers employed in both public and private healthcare organizations in the province of Bergamo, Italy, one of the most affected areas in Europe. Bergamo's death toll in 2020 was 260% higher than in 2019, with most deaths occurring in the first half of 2020 (Nicotra, 2021). A non-probability sampling approach, specifically convenience sampling, was employed to select participants. Participants were contacted via institutional emails, social media platforms (Instagram, LinkedIn, Facebook), and personal contacts. Inclusion criteria included individuals directly involved in patient care during the pandemic.

Data collection was conducted using an online questionnaire. The questionnaire was divided into several sections aimed at investigating the different variables of interest.

The dependent variable, OCBs, was measured using the OCB Scale (Podsakoff *et al.*, 1990), which includes 24 items divided into the five dimensions identified by Organ (1988): Altruism, e.g., "I help colleagues who have a heavy workload"; Conscientiousness, e.g., "I work more hours than I am required to"; Sportsmanship, e.g., "At work, I tend to make simple issues into complex problems" (reverse coded); Courtesy, e.g., "I make an effort to prevent problems with my colleagues"; and Civic Virtue, e.g., "I attend meetings that are not mandatory but are important".

Emotions were measured using the PANAS - Positive and Negative Affect Schedule (Watson and Tallegen, 1985; Watson *et al.*, 1988), which includes 10 positive affective states, such as enthusiastic, proud, and stimulated; and 10 negative affective states, such as distressed, upset, nervous, and afraid.

Emotional labor was measured using the HELS - Hospitality Emotional Labor Scale (Chu and Murrmann, 2006), which includes 19 items divided into the following dimensions: Surface acting, e.g., "I fake the emotions that I show when dealing with patients", and Deep acting, e.g., "I try to change my real feelings to fit those that I need to express to patients".

Organizational identity was measured using the Mael and Ashforth (1992) scale. The scale includes 6 items that describe the degree of attachment and loyalty to the healthcare organization, such as "When someone criticizes the company I work for, it feels like a personal insult".

Shared social identity was analyzed using the scale developed by Drury *et al.* (2016). The scale includes 4 items that measure the extent to which participants identify with others in a natural disaster/emergency context, such as "I felt that the people affected by the emergency were like me".

All questions were evaluated on a 5-point Likert scale, where 1 = strongly disagree and 5 = strongly agree.

Finally, some demographic information was collected from the participants, such as age, gender, type of healthcare organization, professional role, and work experience.

The data were collected during the early phase of the pandemic emergency, between February and May 2020. Participants are assured of confidentiality and informed consent is obtained prior to data collection.

The collected data were analyzed using the statistical software Stata. The main data analysis techniques included descriptive statistics, correlation analysis, linear regression, and mediation analysis.

4. Results

The conducted survey allowed for the collection of a sample of 223 health professionals operating in the province of Bergamo, Italy. The sample composition is reported in Table 1 and the descriptive statistics in Table 1.

Tab. 1: Sample composition

		N	%
Gender			
	Male	79	35.4
	Female	144	64.6
Age			
	20 - 30	35	15.7
	30 - 40	34	15.2
	40 - 50	58	26.0
	50 - 60	70	31.4
	Over 60	26	11.7
Organization			
	ASST (Public Local Health and Social Services Agency)	161	72.2
	Private clinic	44	19.7
	CRI (Italian Red Cross)	9	4.0
	RSA (Residential Care Facility)	5	2.2
	Cooperative	4	1.8
Job role			
	Physicians	104	46.6
	Nurses	90	40.4
	Technicians	8	3.6
	OSS (Healthcare assistant)	8	3.6
	Psychologist / psychotherapist	4	1.8
	Italian Red Cross volunteer	9	4.0
Job seniority			
	0 - 5 years	73	32.7
	6 - 10 years	31	13.9
	11 - 20 years	45	20.2
	over 20 years	74	33.2

N = 223

Source: our elaboration

Tab. 2: Descriptives

		Mean	Std Dev	Minimum	Maximum	Cronbach α
Positive emotions		3.42	0.64	2	5	0.84
Negative emotions		2.96	0.75	1	5	0.88
Emotional labor						
	Deep acting	2.55	0.66	1	4.38	0.77
	Surface acting	2.77	0.77	1	4.36	0.89
Organizational identity		2.97	0.86	1	5	0.88
Shared social identity		3.54	0.81	1	5	0.86
OCBs		3.68	0.49	2.2	4.8	0.88
	Conscientiousness	3.66	0.72	1	5	0.75
	Sportsmanship	4.1	0.56	3	5	0.65
	Courtesy	3.64	0.7	2	5	0.68
	Altruism	3.88	0.69	2	5	0.91
	Civic Virtue	3.14	0.79	1	5	0.77

Source: our elaboration

Correlation analysis reveals that OCBs are positively correlated with positive emotions, deep acting, organizational identity and social identity. Correlations are outlined in Table 3.

Tab. 3: Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
OCBs	1						
Positive emotions	.519**	1					
Negative emotions	0.086	.307**	1				
Deep acting	.203**	.309**	.328**	1			
Surface acting	0.068	.243**	.473**	.503**	1		
Organizational identity	.388**	.411**	.189**	.397**	.141*	1	
Shared social identity	.445**	.626**	0.114	.158*	0.004	.475**	1

Note: * Significant at .05 level; ** Significant at .005 level
Source: our elaboration

To test the research hypothesis, linear regressions were conducted. Gender, age, and job seniority were included as control variables. Multicollinearity diagnostics were computed using the variance inflation factor (VIF) method. Apart from age and job seniority, all VIF results were under 2 and well below the critical value of 5 (Belsley *et al.*, 1980).

As reported in Table 4, positive emotions affect OCBs, while negative emotions display an insignificant relation. These results provide support for H1a but not for H1b, since negative emotions are not related to OCBs.

Tab. 4: Linear regression of emotions on OCBs

	Beta	t	Sig.	VIF
(Constant)	0	12.19	0	
Gender	0.1	1.57	0.119	1.18
Age	-0.01	-0.09	0.929	2.29
Job seniority	0.12	1.47	0.144	2.13
Positive emotions	0.53	8.75	0	1.13
Negative emotions	-0.05	-0.67	0.506	1.22

Note: R = 54, R2 = 0.3, adj. R2 = 0.28
Source: our elaboration

Deep acting has a positive and significant effect on OCBs, while surface acting has an insignificant relation. Therefore, H2a is supported but H2b is not.

Tab. 5: Linear regression of emotional labor on OCBs

	Beta	t	Sig.	VIF
(Constant)	0	17.96	0	
Gender	0.11	1.53	0.128	1.17
Age	0.09	0.89	0.377	2.30
Job seniority	0.089	0.89	0.372	2.30
Deep acting	0.23	3.02	0.003	1.36
Surface acting	-0.01	0.00	1.000	1.41

Note: R = 29, R2 = 0.08, adj. R2 = 0.06
Source: our elaboration

Last, both social and organizational identity impact OCBs. Hence, H3a and H4a are supported by the results.

Tab. 6: Linear regression of organizational identity and social identity on OCBs

	Beta	t	Sig.	VIF
(Constant)	0	17.31	0	
Gender	0.08	1.25	0.213	1.14
Age	-0.05	-0.59	0.554	2.32
Job seniority	0.12	1.37	0.172	2.14
Organizational identity	0.22	3.22	0.002	1.31
Shared social identity	0.35	4.90	0	1.35

Note: R = 50, R2 = 0.25, adj. R2 = 0.23

Source: our elaboration

To test the remaining hypotheses, a mediation analysis with the Sobel Test was conducted. Results show that organizational identity fully mediates the relation between deep acting and OCBs, as the inclusion of organizational identity as a mediator makes the relationship between deep acting and OCBs no longer significant. About 71% of deep acting is mediated by organizational identity (the value is derived from the ratio of the Indirect effect to the Direct effect). However, organizational identity does not mediate the relation between surface acting and OCBs. Hence, H3b is supported, while H3c is not.

Shared social identity partially mediates the relation between deep acting and OCBs but it does not mediate the relation between surface acting and OCBs. The mediation is partial because, even with shared social identity as a mediator, the relationship between deep acting and OCBs remains significant. About 33% of the effect of deep acting on OCB is mediated by social identity (Indirect effect / Total effect). Hence, H4b is supported, while H4c is not. Table 7 shows the results of the significant mediation analyses.

Tab. 7: Significance testing of indirect effect. Sobel Test

Path	Indirect effect	Total effect	St. Er.	z-value	p-value	Conf. Interval	Type of mediation
Deep acting → Organizational identity → OCBs	0.108	0.151	0.026	4.156	0.000	0.057 - 0.159	Full mediation
Deep acting →Shared social identity →OCBs	0.050	0.151	0.022	2.260	0.024	0.007 - 0.093	Partial mediation

Source: our elaboration

Table 8 provides a summary of hypotheses confirmation. Contrary to expectations, negative emotions and surface acting are not related to OCBs. Additionally, neither organizational nor shared social identity mediate the relationship between surface acting and OCBs.

Tab. 8: Summary of hypotheses confirmation

Hypotheses	Result
H1a: In emergency contexts, positive emotions are positively related with organizational citizenship behaviors	Supported
H1b: In emergency contexts, negative emotions are negatively related with organizational citizenship behaviors.	Not supported
H2a: In emergency contexts, deep acting is positively related with organizational citizenship behaviors.	Supported
H2b: In emergency contexts, surface acting is negatively related with organizational citizenship behaviors.	Not supported
H3a: In emergency contexts, organizational identity is positively related with organizational citizenship behaviors	Supported
H3b: In emergency contexts, organizational identity has a mediating role between deep acting and organizational citizenship behaviors	Supported
H3c: In emergency contexts, organizational identity has a mediating role between surface acting and organizational citizenship behaviors.	Not supported
H4a: In emergency contexts, shared social identity is positively related with organizational citizenship behaviors	Supported
H4b: In emergency contexts, shared social identity has a mediating role between deep acting and organizational citizenship behaviors	Supported
H4c: In emergency contexts, shared social identity has a mediating role between surface acting and organizational citizenship behaviors.	Not supported

Source: our elaboration

5. Discussion

We have investigated how emotions, surface and deep acting inherent in emotional labor, organizational identity, and shared social identity influence organizational citizenship behaviors among professionals during crises and emergencies. The data reveal that positive emotions are significantly associated with higher levels of OCBs, supporting the broaden-and-build theory which posits that positive emotions foster proactive, creative and pro-social behaviors (Fredrickson, 2001; Clark and Isen, 1982), especially during crises and emergencies (Yu *et al.*, 2021; Rizaie *et al.*, 2023; Wang *et al.*, 2021). However, partially contrary to previous research (e.g., Spector and Fox, 2002; Mahmoud *et al.*, 2024), negative emotions did not affect professionals' engagement in OCBs. This phenomenon might be attributed to two different reasons. The first plausible reason is related to the complexity of emotions, and particularly of negative emotions that emerge in a crisis context and to the presence of common fate. The multiplicity of emotions (distress, fear, nervousness, exhaustion …) that manifests in a crisis can easily produce different behaviors (Dionne et al, 2018). According to this, anger may result in an engaged response to a crisis event, shame in avoidant response, and fear may result in an affiliative response (Dionne et al, 2018). Analyzing negative emotions as a whole can hence neutralize the effects of different emotions on behaviors, and effects can be different. Furthermore, the neutral effect of negative emotions on OCBs can be related to the sense of common fate that affects people in crisis contexts. As Zizzo (2010) outlines, circumstances where the perception of common fate is strong, as an emergency situation, lead to the choice to undertake cooperative and corporative behaviors, through which people believe to achieve a mutually superior outcome. In these contexts, receiving help and giving help become the priority and the effects of negative emotion on behavior can be neutralized. The second reason can be related to the nature of healthcare professionals. As underlined before, negative emotions are often correlated with counterproductive behaviors (Eissa *et al.*, 2020; AL-Abrrow *et al.*, 2020). On the other hand, as Isen (2001) reveals, the negative effect occurs when negative emotions are not managed effectively. Managing intense emotions-both their own and those of their patients-is crucial for healthcare workers (Riley and Weiss, 2016). Effective emotional management is fundamental not only to prevent burnout and promote overall well-being in the workplace (Hunsaker *et al.*, 2015; Shuler and Sypher, 2000), but also to prevent dysfunctional behaviors. Professionals routinely encounter life-and-death situations, pain, and suffering, even outside of crisis contexts (Maslach and Jackson, 1981, 2013; Hunsaker *et al.*, 2015). Working in healthcare requires professionals to engage with patients continuously. As such, they engage with their own and patients' emotions every single moment, and often in stressful circumstances. Healthcare workers could be able to recognize that negative emotions are an inherent component of their work, and over time, learning by doing through routines, they become capable to manage their emotions during difficult healthcare situations. This can lead to neutralizing negative effects in order to privilege the delivery of health care (Luff *et al.,* 2016). Furthermore, in the healthcare sector cooperation and mutual support are considered necessary to ensure high quality of care (Xyrichis and Ream, 2008; Cheng *et al.*, 2016). This could determine a spontaneous attitude towards citizenship behaviors. Moreover, professionals cannot be considered as a common category of workers since they are linked to each other by a sense of community that has its roots in professionalism (Goode, 1957; Bergamaschi, 2017). As Løwendahl (2005) underlines, the profession is a vocation that is embodied in the application of knowledge to solve the client's problems, in which altruistic attention towards others takes on a role of primary importance compared to the pursuit of selfish objectives.

Related to emotional labor, results indicate that healthcare workers who exhibited high levels of deep acting were more likely to demonstrate increased OCBs, even during an emergency context. These findings support the notion that genuine emotional effort and deep acting can positively influence OCBs (Grandey, 2000, 2003; Wu *et al.* 2024). Conversely, surface acting, characterized by emotional dissonance, was not significantly associated with OCBs. These findings partially align with previous research (Cheung and Lun, 2015; Pohl *et al.*, 2015), which indicated no relationship between surface acting and organizational outcomes. Moreover, these findings align with the nature of healthcare professionals, who can adjust their internal emotions to match the required external expressions (Grandey, 2003), thereby reducing the effort needed to simulate emotions different from those they genuinely feel.

In any case, to further investigate the impact of surface acting on OCBs, these studies suggested incorporating additional moderators, such as emotional intelligence (Cheung and Lun, 2015) or professionalism and organizational identity (Pohl *et al.*, 2015). Additionally, surface acting and emotional dissonance might not directly influence OCBs because individuals may still engage in positive behaviors as a way to cope with, or counterbalance, their emotional experiences (Pohl *et al.*, 2015).

During crises, organizational identity emerged as another strong predictor of OCBs. Healthcare workers who identified strongly with their organization were more likely to engage in behaviors that go beyond their formal job requirements. These results are in line with previous research in other contexts highlighting the important role of identification with the organization in increasing OCBs (Dutton, *et al.*, 1994; Ashfort and Mael, 1989; Newman *et al.*, 2016), and corroborate results obtained by Lian *et al.* (2022) in conditions of uncertainty. In addition, findings showed that organizational identity fully mediates the relationship between deep acting and OCBs. This result is significant as it supports the idea that deep acting and emotional effort enhance organizational identity, which in turn increases the likelihood of engaging in positive behaviors even in crises and emergencies situations.

Shared social identity also played a crucial role in promoting OCBs, aligning with social identity theory (Tajfel and Turner, 1986). Healthcare workers who felt a strong sense of belonging to a group of people with different roles (patients and citizens) during COVID-19 pandemic, were more inclined to exhibit OCBs. This finding aligns with previous research suggesting that social identity can be a source of resilience and mutual support in challenging times (Haslam *et al.*, 2009a; Drury *et al.* 2016) and allows us to highlight how during emergencies the creation of a shared identity, even if temporary, stimulates behaviors of solidarity and mutual support. In addition, our results showed that shared social identity partially mediated the relation between deep acting and OCBs. Hence, this research provides evidence that a strong sense of shared social identity can explain, although partially, the positive effect of deep acting on OCBs.

6. Theoretical contributions and managerial implications

This study contributes to the literature on OCBs by supporting the role of positive emotions, deep acting, organizational identity, and shared social identity as drivers of positive organizational behaviors, during extreme emergency situations. While the presence of positive emotions during the COVID-19 pandemic may seem surprising, research indicates that extraordinary events, such as a health crisis, can evoke complex emotional responses (Wang *et al.*, 2021). In crisis situations, individuals may still experience positive emotions when they perceive their work as contributing to a meaningful cause or the greater good, or they can engage in emotional effort to act and align with job demands (Wu *et al.* 2024). External threats, in addition, can enhance the sense of "organizational we-ness" among employees (Greenaway and Cruwys, 2019) reinforcing organizational identity, and the sense of "common fate" among professional, patients, and citizens, reinforcing shared social identity (Drury, 2018), which in turn

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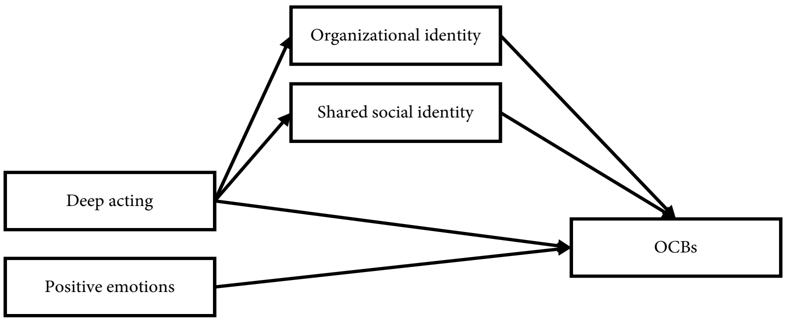
foster OCBs. While deep acting, organizational, and social identity have been already studied as antecedents of positive organizational behaviors, this research highlights that engaging in deep acting during crisis situations increases the sense of belonging to an organization or to a social group, which in turn leads to higher OCBs. In other words, by aligning their felt emotions with organizational expectations, employees strengthen their identification with the organization, while by aligning their felt emotions with patients and citizens, a new shared identity arises and produces an increased willingness to engage in those extra-role, cooperative behaviors that benefit the organization. The findings and main contributions of the study are reported in Figure 7.

Fig. 7: The theoretical model



Source: our elaboration

The study's findings also have significant managerial implications, particularly in times of crisis. It is essential to foster positive emotional states in employees, given the positive relationship between emotions and OCBs. Managers can implement programs and practices that boost morale and reduce stress, such as regular mental health check-ins and support groups to address the emotional needs of their workers. Employees should also be equipped with the skills and resources to manage their emotional labor effectively. This can be achieved through workshops and seminars on balancing emotional labor or training programs focused on emotional intelligence, stress management, and resilience-building. Access to professional counseling services and peer support networks can also help workers navigate the emotional challenges of their roles, including mindfulness and cognitive-behavioral strategies. Strengthening organizational identity is another important strategy. Initiatives aimed at reinforcing organizational identity can enhance OCBs and, consequently, organizational performance. These strategies include creating and communicating a clear organizational mission and values that workers can align with and take pride in, involving workers in decision-making processes to foster a sense of ownership and belonging, and promoting inter-functional collaborations and team-building activities to strengthen the connection between employees and the organization. Finally, fostering a sense of community and shared purpose is vital for maintaining high levels of OCBs. Managers can organize team-building events and social activities to enhance camaraderie and mutual support, develop mentorship and buddy programs to facilitate peer support and knowledge sharing, or encourage interdisciplinary collaboration to create a cohesive and united workforce. Additionally, creating alliances with customers, suppliers, and financiers, exchanging information, demonstrating openness to collaboration, and creating open teams become crucial for facilitating the development of a shared social identity that can support the company during times of crisis.

By implementing these mechanisms, organizations can support the emotional states of their workers, enhance their identification with the organization, and foster a collaborative and positive work environment and out-group relationship, even during emergencies. These measures are particularly relevant for organizations that are inherently stressful and often deal with challenging situations. However, it can also be argued that similar approaches are beneficial in other contexts where significant emotional components and worker-customer interactions are on the agenda.

7. Conclusions, limitations and further research

This study explored the complex interplay between emotions, emotional labor, organizational identity, shared social identity, and OCBs during emergency contexts. The COVID-19 pandemic was taken as an illustrative case of an extreme emergency, and the research was conducted within the healthcare sector, as it was heavily impacted by the pandemic. We show that positive emotions, deep acting, organizational and shared social identity encourage organizational citizenship behaviors. The effect of deep acting on organizational citizenship behaviors is positively mediated by both organizational and shared social identity. Our work therefore contributes to the literature on OCBs, by showing that in crisis contexts, deep acting and a strengthened sense of organizational and social identity can foster higher OCBs by enhancing employees' alignment with both organizational and communal goals. In terms of managerial implications, our findings suggest that managers can play a significant role in promoting OCBs during emergencies by investing in a positive work environment and in the development of a strong organizational and shared social identity, engaging employees in deep acting.

This research has certain limitations that offer interesting opportunities for further exploration. First, the sample, consisting solely of healthcare workers from the province of Bergamo, may not fully capture the nuances present in other sectors or geographical areas. Broadening the scope to include diverse professions or cultural contexts could enhance the understanding of the investigated dynamics. While many studies have emphasized healthcare (e.g., Nunes *et al.*, 2024) or the hospitality industry (e.g., Yu *et al.*, 2021), other service sectors where worker-customer interactions play a critical role also warrant exploration.

Even within the healthcare sector, a more detailed analysis could benefit from incorporating additional control variables, such as professional profiles. These variables could reveal significant differences. For instance, it would be valuable to investigate how emotions and emotional labor impact nurses who work closely with patients, compared to clinicians, who are generally more professionally and emotionally detached (Chattopadhyay, 2024). Nurses often report significantly higher levels of emotional labor and burnout, along with significantly lower physical and mental health scores compared to doctors and other professionals (Wen *et al.*, 2023).

Furthermore, the reliance on self-reported data may introduce biases. Previous studies have shown that self-reported OCB ratings differ very little from other reported ones and that common method bias is unlikely to occur in this type of research (Carpenter *et al.*, 2014; Chattopadhyay, 2024). However, incorporating objective or observational measurements of OCBs could help mitigate such biases and provide a more comprehensive perspective.

Finally, as already mentioned, negative emotions were analyzed as a whole, while it could be interesting to focus on specific emotions to better understand how, in crises, they may differ in their effects on behaviors. This is particularly important because, unlike positive emotions, the impact of negative emotions on OCBs is not always straightforward (Wang *et al.*, 2021). As suggested by the literature, specific emotions such as anger, fear, or shame (Dionne et al, 2018) may have differing impacts on OCBs. Exploring these nuances could provide a clearer understanding of the role of negative emotions, particularly in emergency contexts.

Last, future research could benefit from employing longitudinal designs to provide deeper insights. Such studies could investigate the effectiveness of targeted interventions, including team-building programs or communications that highlight organizational "we-ness," in fostering collective identification and maintaining cooperative behaviors over time.

In summary, future research should aim to validate and expand upon these findings, contributing to a more comprehensive understanding of the factors that drive positive organizational behaviors during crises.

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