

Editorial: Innovation, knowledge and digitalization: building trust to face today's challenges

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In the contemporary global business and economic landscape, the dynamic interplay of innovation, knowledge and digitalization has become a transformative force. Within an increasingly interconnected and rapidly evolving world, the imperative of cultivating trust has reached unprecedented significance. Trust, serving as a foundational element for the sustainability and resilience of societies, forms the bedrock upon which thriving economies and flourishing enterprises are constructed. This special issue endeavors to scrutinize the intricate mechanisms by which innovation, knowledge and digitalization act as catalysts, fostering and fortifying trust to address the multifaceted challenges confronting societies today. Concurrently, the foremost challenge for firm growth resides in the adept integration of digital technologies within novel business models. Consequently, firms are progressively engrossed in digital transformation, involving the digitalization of business models and the application of technology to enhance internal and external processes, all while integrating these advancements into innovative business frameworks (Kraus *et al.*, 2022). The efficacy of such digital transformation inherently demands diverse knowledge derived from various sources within the firm.

Digital transformation, a pivotal force in the contemporary global business and economic landscape, is intricately intertwined with the dynamic interplay of innovation, knowledge and digitalization. Its transformative impact extends beyond particularly innovative businesses, digital start-ups and high-tech giants, encompassing companies of all sizes and operating in diverse industries. This paradigm shift, exemplified by innovative companies like Uber, Airbnb and Spotify, revolutionizes the way companies operate and develop relationships within and across ecosystems, introducing new managerial opportunities and challenges across industries of all sizes and types (Di Vaio *et al.*, 2021; Hanelt *et al.*, 2021). As the imperative of cultivating trust gains unprecedented significance in this era of rapid change, trust becomes a linchpin in navigating the complexities of multi-stakeholder collaborations for new product development (NPD) within the digital transformation landscape. Strategies for NPD must align with the digitalization of business models, where the integration of technology plays a central role in enhancing internal and external processes, and these advancements are seamlessly woven into innovative business frameworks (Bounchen *et al.*, 2021). Digital transformation, marked by revolutionary technologies such as big data, artificial intelligence, 4.0 machines, 3D printers and social media networks (Bhukya and Paul, 2023; Chen *et al.*, 2022; Li *et al.*, 2021; Rajarathinam *et al.*, 2022), fundamentally shapes contemporary business practices. However, despite the wealth



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of knowledge, there remains a crucial gap in understanding how businesses of all sizes can effectively implement digital innovative strategies for growth and scalability.

The articles were selected from the 18th Academy of Innovation, Entrepreneurship, and Knowledge (ACIEK) Conference, which took place in a hybrid form. The papers were then submitted to a rigorous double-blind review process following the journal's ethics, in addition to having potential reviewers in the mentioned area. The papers selected for publication in this special issue represent a diverse array of cutting-edge research and scholarly inquiries, illuminating the intricate dynamics between innovation, knowledge and digitalization within the realms of management and business economics. From explorations of disruptive technological advancements to analyses of knowledge-sharing networks and the strategic deployment of innovative practices, the contributions within this issue collectively offer a comprehensive and insightful examination of the contemporary landscape of business and economics.

The first paper, titled "Branding fashion through gameplay: the branded gaming and the cool dynamics in the fashion markets. A game-theory approach" (DOI: <https://doi.org/10.1108/EJMBE-06-2023-0179>) by Alshaimaa Bahgat Alanadoly and Suha Fouad Salem, explores the influence of immersive gaming on brand coolness and equity, specifically focusing on collaborations between the fashion industry and gaming. Using game theory as a conceptual framework, the study analyzed the decision-making process of fashion consumers within gaming environments, with a particular emphasis on the moderating role of gender. The study employed a quantitative approach, utilizing the partial least squares structural equation modeling technique and a sample of 160 active Malaysian gamers. The findings indicate a positive association between brand equity and perceived brand coolness. Of the three core values of online games, perceived enjoyment was found to have the strongest correlation with perceived brand coolness, surpassing self-expression and perceived emotional challenge. The analysis of gender differences suggested that while female respondents were significantly influenced by branded gaming experiences, the impact was comparatively weaker among male respondents, implying a potential gender-specific approach in fashion gaming marketing strategies. The research contributes to the existing literature by providing a comprehensive understanding of the impact of immersive gaming branding practices on fashion brand equity. The findings shed light on the critical role of gaming experiences in shaping consumer behavior and offer valuable insights for fashion brand managers seeking to leverage gaming collaborations to enhance consumer perceptions. The article's theoretical implications extend the conceptualization of brand coolness to incorporate Web3 immersive gaming experiences, underscoring the significant influence of gender in the context of branded gaming. The study emphasizes the pivotal role of perceived enjoyment, self-expression and emotional challenge in shaping perceptions of brand coolness, with these factors collectively explaining a substantial portion of the variance in perceived fashion brand coolness. Practical implications suggest that fashion brand managers should focus on integrating enjoyable gaming experiences into their marketing strategies, emphasizing customization options and interactive elements to enhance player engagement. Creating opportunities for players to showcase their self-image within the game environment can contribute significantly to perceived brand coolness. Moreover, the findings emphasize the potential of branded gaming as a means to foster brand loyalty and connection among consumers. In conclusion, the article underscores the significant potential of gaming collaborations in shaping brand perceptions and highlights the need for a nuanced understanding of the role of gender in the context of fashion branding within gaming environments. The insights presented in the study offer valuable guidance for practitioners seeking to optimize their marketing and branding strategies within the increasingly interconnected realms of gaming and fashion.

In the second contribution, titled "Expanding career adaptability: connections as a critical component of career success" (DOI: <https://doi.org/10.1108/EJMBE-06-2023-0185>) written by

Anita Gaile, Ilona Baumanė Vitolina, Agnis Stibe and Kūrmets Kivipõld, the authors delve into the relationship between career adaptability and social connections within the context of subjective career success. They argue that professional achievement hinges not only on adaptability but also on the networks individuals cultivate in their professional spheres. Conducted in Latvia with 390 respondents, the study utilized the Perception of Career Success measure and the Career Adaptabilities scale. Findings underscore the pivotal role of workplace relationships in subjective career success and identify 12 moderators influencing this relationship. Workplace connections demonstrate a more substantial influence on subjective career success compared to career adaptability factors. Variables such as tenure in the current position and current monthly salary exhibit no significant influence on the model's relationships. Higher educational credentials show a negative moderating impact on the relationship between connections and subjective career success, indicating that highly-educated individuals rely less on workplace connections for career fulfillment. Behaviors associated with self-assurance and future planning do not significantly moderate subjective career success. Adaptability behaviors seem less influenced by moderators than workplace connections, potentially due to their more internal focus, in contrast to the external social behaviors represented by the latter. Professionals with extensive work experience prioritize workplace relationships, while those with limited experience emphasize adaptability behaviors. Connections appear to compensate for individuals facing initial job dissatisfaction. Individuals without prior unemployment experience attribute greater significance to workplace connections in determining their career success. Marital status plays a role, with married individuals attributing more significance to workplace connections than unmarried individuals. The number of children in a family diminishes the impact of both connections and confidence behaviors on career success. The article highlights the mounting importance of interpersonal bonds in professional settings when evaluating career achievements. It challenges the conventional focus on individual career adaptability, emphasizing the pivotal role of professional collaborators in shaping career trajectories. The diverse moderation effects on the relationship between connections and career success underscore the intricate nature of career development strategies. Factors such as educational background, professional tenure, initial job contentment, unemployment history and familial contexts collectively shape individuals' perceptions and attainment of career success. The study suggests that career development strategies may diverge based on an individual's life stage, familial circumstances and sociodemographic factors. This study emphasizes that workplace interpersonal relationships exert a more substantial impact on subjective career success than career adaptability alone, introducing the concept of the "fifth C," Connections, as a pivotal factor influencing career achievements. The research provides fresh insights, particularly regarding the interplay of familial circumstances with workplace connections, adding nuance to our understanding of the complex dynamics linking career achievements and social affiliations.

Valeska V. Geldres-Weiss, Carolina Nicolas and Nathaniel P. Massa are the authors of the critically reviewed on food eco-labels in the research domain areas of business and management titled "Toward a sustainable research agenda on food eco-labelling in the business and management research domain" (DOI: <https://doi.org/10.1108/EJMBE-08-2023-0246>) aiming to identify research gaps and contribute toward a future research agenda in the field. This paper presents a hybrid integrated review combining bibliometric analysis with an in-depth framework-based study of theories, contexts, characteristics and methodology (TCCM), reviewing quality research published over the 21 years between 2002 and 2022. The findings suggest that future researchers should further explore food eco-label dynamics and phenomena in areas related to consumer behavior, information, consumer knowledge, environmental concern, trust, packaging and willingness-to-pay as antecedent factors. Moreover, identifying the key research themes and knowledge structure of food eco-label research, this review contributes and adds value to the literature in the domain research areas

of business and management in terms of quantification of extant publications and consolidation of research evolution. The study acknowledges limitations in its research scope, focusing exclusively on the Web of Science database and the field of business and management. Practical implications highlight the need for better communication and dissemination of knowledge about eco-labels to consumers. The article concludes with recommendations for future research, emphasizing the importance of solid theoretical foundations, cross-cultural considerations and the expansion of research to different food categories and types of eco-labels. The study underscores the significance of effective communication and information dissemination about eco-labels for consumers, emphasizing their role in promoting sustainability in the food industry. It calls for the harmonization and standardization of eco-labels both nationally and globally to address consumer confusion and promote sustainable practices. This paper represents a novel approach within eco-label research by integrating bibliometric analysis with a comprehensive theoretical framework (TCCM), providing a valuable perspective that will contribute to the continued advancement of this ever-evolving field.

In the last paper, titled “Exploring flexible working practices and the digital divide in a post-lockdown era” (DOI: <https://doi.org/10.1108/EJMBE-08-2023-0247>) by Lebene Richmond Soga, Yemisi Bolade-Ogunfodun and Anna De Amicis conduct a comprehensive analysis of the intricate dimensions characterizing the digital divide within the landscape of flexible working practices (FWPs) during the post-lockdown period, utilizing an actor-network theory (ANT) perspective. Their research highlights the need to transcend the traditional understanding of the digital divide merely as a matter of access to digital tools, emphasizing the broader range of challenges that impede the effective utilization of technology within the domain of FWPs. The authors bring to light how the implementation of FWPs, made feasible through digital technologies, has exposed underlying inequalities, underscoring the critical significance of comprehending the diverse user responses embedded within distinct technological contexts. In a notable theoretical contribution, the paper redefines the digital divide as a complex interplay of heterogeneous networks, shedding light on the dynamic nature of FWPs which surpasses the realm of mere technological access. This conceptual reframing offers a nuanced understanding of the intricate processes and negotiations that individuals navigate within their specific work environments, pointing to the intertwined relationship between technology and socio-economic factors. Furthermore, the study underlines the practical implications of these findings, advocating for a holistic restructuring of organizational systems, custom-tailored assessment mechanisms and strategic regulatory interventions to effectively address the multifaceted challenges arising from the digital divide. The authors underscore the pressing need for proactive interventions from organizational leaders and human resource managers to cater to the needs of employees who may silently grapple with the repercussions of the digital divide, stressing the imperative of fostering a supportive and inclusive work environment. Additionally, the paper outlines key directions for future research, emphasizing the importance of delving deeper into the diverse networks influencing individual participation in FWPs, particularly as organizations navigate the transition back to physical work settings and hybrid work models. The authors advocate for a comprehensive exploration of the motivations and experiences of marginalized workers within the framework of FWPs, urging a nuanced understanding of their responses within diverse technological landscapes. Moreover, the study underscores the pivotal role of tracing diverse actors, both human and non-human, within these networks, emphasizing the need to comprehend the nuanced negotiations individuals undertake within the complex and evolving terrain of the digital divide. Ultimately, this research serves as a crucial call to action for organizations to adopt proactive measures that foster equitable access and opportunities for all employees, effectively addressing the challenges exacerbated by digital

disparities in the post-lockdown era. The comprehensive analysis provided by the authors contributes significantly to the ongoing discourse on the evolving nature of work practices and their intricate relationship with digital inclusion, emphasizing the critical importance of a holistic and inclusive approach in addressing the multifaceted dimensions of the digital divide within contemporary work environments.

We invite our readers to immerse themselves in the rich tapestry of insights presented within this special issue, with the hope that the diverse perspectives and nuanced analyses contained herein will inspire new avenues of enquiry and engender a deeper appreciation for the transformative power of innovation, knowledge and digitalization in fostering trust and resilience in the face of today's multifaceted challenges. With this special issue, the *European Journal of Management and Business Economics* reaffirms its commitment to fostering rigorous scholarly dialogue and promoting innovative research that addresses the complex and evolving landscape of contemporary business and economics.

We sincerely hope that this collection of articles serves as a catalyst for further exploration and collaborative endeavors aimed at shaping a more resilient and prosperous future for our interconnected global community.

Alba Yela Aránega and Juan Miguel Alcántara-Pilar

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Branding fashion through gameplay: the branded gaming and the cool dynamics in the fashion markets. A game-theory approach

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Abstract

Purpose – The aim of this study was to investigate the role of immersive gaming on brand coolness and brand equity, with particular emphasis on fashion gaming collaborations. We used game theory as a theoretical framework to analyse immersive branding strategies and gain a deeper understanding of fashion consumers' decision-making process in gaming environments. Gender, as a significant factor affecting gamers, has been studied as a moderator that impacts the overall proposed framework.

Design/methodology/approach – A quantitative method was used to assess the significance of relationships within the proposed model empirically. The partial least squares structural equation modelling technique was implemented to assess the relationships of the framework with a sample size of 160 active Malaysian gamers.

Findings – The findings indicate that brand equity is positively associated with perceived brand coolness. Furthermore, of the three core values of online games, perceived enjoyment is most strongly associated with perceived brand coolness, ahead of the values of self-expression and perceived emotional challenge. The results of the multigroup analysis further suggest that in the fashion industry, building brand equity through online games is strongly related to perceived brand coolness among female respondents, the role of perceived brand coolness being weaker among male respondents.

Originality/value – The study contributes to the existing literature by providing a deeper understanding of the impact of immersive gaming branding practices on the overall equity of the fashion brand. The results provide insight for fashion brand managers into the significant effect on consumer behaviour outcomes of fashion-gaming collaborations.

Keywords Game-theory, Asia-Pacific, Brand coolness, Brand equity, In-game advertising, Advergaming

Paper type Research paper

1. Introduction

According to the latest market reports, the global gaming market reached USD\$396.20bn in 2023, with a user base of nearly 3 billion gamers. In particular, Asia-Pacific accounts for 48% of these gamers (Statista Market Insights, 2023a), while in-game advertising is becoming more popular worldwide and is expected to reach USD\$23.95 m by 2027 in Malaysia alone



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(Statista Market Insights, 2023b). During the pandemic, fashion brands entered the gaming industry (Hanson, 2022), resulting in 50% of gamers reacting more positively to brands they encounter in-game (Jakob and Meehan, 2023). Studies have shown that players spend more on gaming self-representation products (Li *et al.*, 2020), and the acquisition of virtual in-game assets is estimated to reach USD\$74.4bn by 2025 (Clement, 2021), with an estimated Malaysian virtual assets market USD\$55.56 per gamer in 2023 (Statista Market Insights, 2023c). Furthermore, a survey conducted by Business of Fashion (2022) revealed that 50% of fashion consumers intend to spend more on digital assets. These market statistics indicate the potential of immersive gaming as a branding avenue for fashion brands, while recent studies have correlated gaming experiences with individual values, such as enjoyment (Fernández-Ruano *et al.*, 2022), self-expression (Bogicevic *et al.*, 2021) and perceived challenges (Xi and Hamari, 2019).

From a branding perspective, brands have adopted gamification concepts to simulate consumer perceptions, attitudes and behaviour by leveraging the immersive storytelling abilities of games (Wunderlich *et al.*, 2020). Gaming platforms have disrupted traditional shopping touchpoints, affecting consumers' behavioural outcomes towards brands and their products (Wang, 2021; Yoo *et al.*, 2023). Fashion brands collaborate with the gaming industry through in-game advertising (branded elements within gaming platforms as an advertising strategy) and advergames (digital content that mimics gaming environments to promote brand core messages) (Ghosh *et al.*, 2021). Those collaborations aim mainly to promote and convey brand messages in a less aggressive form of advertising (Ghosh *et al.*, 2021). For instance, Balenciaga debuted their F/W21 collection through the advergame "*Afterworld: The Age of Tomorrow*". A year later they partnered with Epic Games to provide in-game skins for Fortnite's shopfront (Balenciaga Brings High Fashion to Fortnite-Epic Games, 2021). On the other hand, Gucci has reported the purchase of a virtual version of its signature bag in Roblox for \$4,000, which is almost double the price of its physical version (Yoo *et al.*, 2023). Nike's acquisition of the gaming studio RTFKT and the launch of their Roblox game Nikeland have contributed to their ranking as one of the top 10 brands globally in 2022 and 2023, with Nikeland attracting 7 million visitors since its launch in 2022 (Brujó, 2022; Marr, 2022).

While gaming and its values are typically associated with younger consumers, research showed that brand coolness is also an emotionally driven construct closely linked to younger generations (Chen *et al.*, 2021; Loureiro *et al.*, 2020), with perceived coolness of a brand can lead to positive outcomes, such as brand love (Warren *et al.*, 2019). Brands can enhance consumer-brand bonding by adopting innovative interactive marketing practices that activate consumers' perceptions of brand coolness (Bogicevic *et al.*, 2021). Coolness can also catalyse purchase intentions, highlighting the significance of cool images in self-interested advertising appeal (Lu *et al.*, 2021). Building on this argument, younger consumers are more likely to be attracted to brands with a cool image. Additionally, brand equity can be a valuable asset in shaping consumer behaviour (Upadhyay *et al.*, 2022), as studies have linked brand equity to consumer awareness, associations, perceived quality, and loyalty, all of which contribute to favourable consumer behaviour towards branded products (Fernández-Ruano *et al.*, 2022). To understand the impact of gaming practices on brand equity, it is vital to study the interplay between physical and virtual branding practices, particularly for fashion branding. Although gamified retail experiences have been extensively researched, there is a lack of research on how gaming variables affect consumer attitudes towards overall brand equity, affecting physical brands.

This study aims to comprehensively examine the relationship between immersive gaming, brand coolness, and brand equity in the fashion industry. Using game-theory as a theoretical framework, we analysed immersive branding strategies and the decision-making processes of fashion consumers in gaming environments. We systematically explore the values and rewards that influence gamer choices when engaging with fashion brands during gameplay, while taking into account individual values and gender differences. Our study was guided by the following central research questions:

RQ1. How do individual game values affect consumers' perceptions of fashion brand coolness through gameplay interactions?

RQ2. What is the impact of branded gameplay on the overall equity of fashion brands?

This study contributes to the existing literature in four ways: (1) extending the understanding of gaming branding strategies in fashion markets as a prominent business model; (2) testing the model in light of game-theory to enhance the understanding of decision-making in virtual environments; (3) identifying potential factors that contribute to and result from brand coolness in immersive gaming environments; and (4) examining the possible moderating effect of gender on the relationships between antecedents and outcomes.

2. Review of the literature

Building on decision-making theory, game-theory was introduced by Morgenstern and Von Neumann in 1944 and has been applied across various scientific fields, including mathematics, economics, and behavioural and social sciences (Patra and Ghose, 2020). The orthodox structure of the theory comprises three main elements: (1) players/decision-making participants; (2) strategies; and (3) rewards (Abedian *et al.*, 2022; Samsura and van der Krabben, 2012). Players engage in conflicts and employ distinct strategies to attain optimal rewards within their game environment (Muggy and Heier Stamm, 2014; Samsura and van der Krabben, 2012). Game-theory from this perspective allows the examination and exploration of behavioural outcomes concerning various stakeholders; including consumers, brands and retailers, with a focus on capturing value (Abedian *et al.*, 2022; Samsura and van der Krabben, 2012).

Our study utilizes game-theory to analyse the variables and provide a rational explanation for branding decisions in immersive retail environments. The different immersive experiences offered through gaming platforms and virtual environments are studied as strategies through which consumers are exposed to branding activities. Players—in this case, fashion brands—use strategies to optimize their rewards or exchange value with consumers in the form of perceived coolness and brand equity (Figure 1). The theory will expand the understanding of fashion consumers' adoption and decision-making processes, as well as their behavioural considerations within the dynamic immersive retailing context (Abedian *et al.*, 2022; Hanley, 2021).

Marketing studies, on the other hand, emphasize that brands are initially perceived as cool within subcultures—gamers, in our case—as a means of distinguishing themselves from others, before this perception extends to mass consumers (Warren *et al.*, 2019). Brand coolness from this perspective is a significant emotionally driven construct that influences consumers' attitudes (Loureiro *et al.*, 2020; Lu *et al.*, 2021). As a term, coolness has been studied in the context of luxury fashion (Loureiro *et al.*, 2020), technology products (Tiwari *et al.*, 2021), sustainable products (Lu *et al.*, 2021), and consumer values (Truong *et al.*, 2021), among others, while cool brands are subjectively labelled by consumers as timely, fashionable, sophisticated, transformative, unique, aesthetically pleasing, entertaining, revolutionary, prestigious, useful, iconic, subcultural and/or desired (Jiménez-Barreto *et al.*, 2022; Loureiro *et al.*, 2020).

Brand equity as another construct, is recognized as a valuable intangible asset for brands that seek to establish a global reputation (Dang Lang *et al.*, 2022). Brand equity is defined as a collection of assets and liabilities experienced through brand names and logos that shape consumer behaviour (Upadhyay *et al.*, 2022). While brands are struggling with interactive strategies to position themselves within competing technology-driven global markets, fashion marketers are targeting immersive technologies as a futuristic disruptive approach to restructure fashion branding and leverage the business model (Reactive Reality, 2022;



Source(s): Figure denoted by authors

Figure 1.
Game theory
framework

Salem *et al.*, 2023a, b). Through the integration of game-theory, brand coolness, and brand equity, we attempt to justify theoretically and empirically the decision-making process within immersive gaming platforms and how it may affect the equity of fashion brands and their market positioning. By adopting these theoretical grounds and focussing on the Asian market as a leader in the gaming market, the authors attempt to explore a path towards immersive technologies that can shape consumer behaviours within gaming platforms.

3. Development of hypotheses

3.1 Conceptual model

While game-theory is a refined decision-making theory in behavioural sciences, consumer involvement in immersive games is positively associated with brands and retailers (Gerdenitsch *et al.*, 2020; Syrjälä *et al.*, 2020). Similar findings have been demonstrated regarding brand coolness, which serves as a self-expressive motivator for fashion consumption (Loureiro *et al.*, 2020). Younger consumers, representing the largest segment of the gaming market, actively seek cool brands as constructive prosocial power that illustrates their social image within their peer groups (Chen *et al.*, 2021; Loureiro *et al.*, 2020). Meanwhile, their perceptions of brand values are influenced by brands that effectively identify their individual and social values (Alanadoly and Salem, 2021). By adopting innovative immersive gaming, brands can activate consumers' perceptions of brand coolness and enhance consumer-brand bonding (Bogicevic *et al.*, 2021). Considering the findings of

previous studies, we formulated a set of hypotheses regarding the relationships between the focal constructs. We propose that gaming and its associated values are related to how consumers perceive a brand as cool. Furthermore, we anticipate that the perception of brand coolness will contribute to higher brand values, as reflected in brand equity. Given the established gender differences in gaming consumption, we examined the potential variations between male and female respondents (Figure 2).

3.1.1 Perceived enjoyment of gaming. Gaming emerged as a branding tool in the fashion industry, encompassing luxury to fast fashion brands. Consumer enjoyment plays a critical role in gameplay, with emotional attachment to game characters being reported as a key reason for playing (Malik *et al.*, 2020). Immersive engagement in a playful gaming context is associated with individuals perceiving their interaction as motivational and enjoyable (Hwang and Choi, 2020; Tanouri *et al.*, 2019, p. 1208). Enjoyment from this perception is the third main variable explaining gameplay in addition to playfulness and game flow (Hamari and Keronen, 2017).

Gamers consider enjoyable games valid for acceptance and intention to play (Jang and Park, 2019). Prior research links enjoyable gamified experiences to consumer behavioural outcomes, such as loyalty, trust (Jang and Park, 2019), purchasing intentions (Bittner and Shipper, 2014), and brand equity (Fernández-Ruano *et al.*, 2022). Hwang and Choi (2020) applied social exchange theory, confirming that consumers perceived gamified loyalty programs as enjoyable and fun. Therefore, enjoyable gamification has the potential to create remarkable consumer experiences that can lead to long-term favourable behaviour towards a brand (Fernández-Ruano *et al.*, 2022). We anticipate that immersive, enjoyable gaming features will positively impact the perceived coolness of fashion brands, thus,

H1. Players' perceived enjoyment is positively associated with their perception of brand coolness on immersive gaming platforms.

3.1.2 Online self-Identities. Brands are interested in how consumers create their self-identity (Tiwari *et al.*, 2021). Research has shown that consumers' digital self-presentation is important for their decision-making journey (Carton *et al.*, 2016; Hernández-Serrano *et al.*, 2022; Hoyer *et al.*, 2020). Gamers also consider their in-game self-represented avatars to be crucial for a positive gaming experience (Ko and Park, 2021; Li *et al.*, 2020).

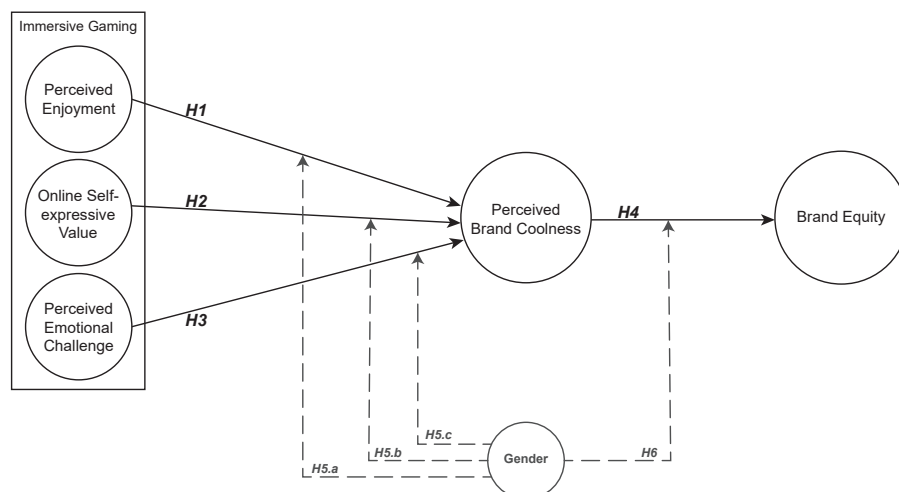


Figure 2.
Conceptual framework

Source(s): Figure denoted by authors

A recent report by Herrera *et al.* (2022) found that 47% of Gen Z Roblox users used avatars for self-expression, positively contributing to their self-perception. Of these, 70% said that their real-life fashion choices were influenced by Roblox avatars. Other studies have shown that being virtually unique and distinguishable from others affects gamers' buying intentions (Li *et al.*, 2020), while Ko and Park (2021) highlighted the willingness of gamers to spend on self-image-represented characters.

Fashion brands consider consumers' ability to self-express themselves in social settings as a crucial factor in their decision-making process (Loureiro *et al.*, 2020), and studies have shown that fulfilling consumers' self-expression needs through brand products motivates consumers' purchasing intentions (Ajitha and Sivakumar, 2019; Hoyer *et al.*, 2020). We hypothesize that the presence of fashion brands on gaming platforms through advergames or in-game collaborations, where consumers can acquire branded fashion items, will influence the communication of their online identity and lead to perceiving these brands as cool. Thus,

H2. Players' perceived online self-expressive value is positively associated with their perception of brand coolness on immersive gaming platforms.

3.1.3 Emotional challenge. Emotional engagement in digital gaming is essential. Kou and Gui (2020) found that gamers adapt their in-game behaviour based on the emotions they experience. Positive emotions from socializing, teamworking, and competition motivate gamers to participate. However, negative emotions, such as tension, anxiety, and anger, can also enhance gamers performance (Denisova *et al.*, 2021; Gowler and Iacovides, 2019). The term "emotional challenge" from this perspective relates to players' experiences with curious emotional ambiguity that elicits a range of emotional, and reflective cognitive experiences (Peng *et al.*, 2020).

Beyond the realm of gaming, studies of consumer behaviour have emphasized the importance of emotional experiences in stimulating consumer behaviour and influencing cognitive decision-making processes (Heffner and FeldmanHall, 2022; Tyack and Mekler, 2021). These experiences have significant value in branding, where gamified emotional experiences have been linked to favourable affective behavioural responses (Razzaq *et al.*, 2017). Considering these findings, we propose that the psychological response to perceived brand coolness is influenced by emotional challenges presented in gaming. Thus:

H3. The players' perceived emotional challenge is positively associated with their perception of brand coolness within immersive gaming platforms.

3.1.4 Perception of brand coolness. Brand coolness has been studied with respect to various marketing constructs. Jiménez-Barreto *et al.* (2022) conducted qualitative and quantitative studies and found that niche cool brands have high value, popularity, exclusivity, and authenticity, which induce consumer's loyalty. Tiwari *et al.* (2021) demonstrated that 78% of brand love could be attributed to perceived brand coolness. In the fashion industry, Loureiro *et al.* (2020) reported a positive association between brand desire and perceived coolness of luxury brands. Similarly, Truong *et al.* (2021) found a positive relationship between hedonic and utilitarian coolness and product value perceptions in fashion retail. Positive brand experiences from this perspective enhance fashion brand coolness (Napalai and Khamwon, 2023). Guerreiro *et al.* (2023) affirmed marketing practitioners must consider brand coolness for strong positive consumer responses.

From a technological perspective, virtual reality in online gaming is often seen as "cool," where perceived coolness drives digital product usage for specific consumer groups (Li *et al.*, 2021). We expect fashion brands collaborating with gaming environments to be perceived as cool, while boosting overall brand equity as a favourable outcome. Thus:

H4. Fashion brand equity is positively associated with consumers' perceptions of brand coolness on immersive gaming platforms.

3.1.5 Modifying the effects of gender. The gaming literature has extensively considered sociodemographic variables, including age and gender, in examining various gaming constructs, such as self-efficacy (Polo-Peña *et al.*, 2021), gameplay intention (Jang *et al.*, 2021), new game adoption (Wang, 2014), and team member selection (Lou *et al.*, 2020). Jang *et al.* (2021) found that female gamers exhibit more resilience and less risk-taking behaviour compared to male gamers when engaging with new games. Males are less motivated to participate in gamified self-efficacy and workplace health programs (Lier and Breuer, 2020; Polo-Peña *et al.*, 2021), but they are more willing to engage with new technologies (Alshurideh *et al.*, 2021; Gumz and Fettermann, 2021). Lou *et al.* (2020) also found that female gamers are less likely to actively participate in social bonding through team collaboration in online games. As gender is a significant factor impacting fashion consumption through different behavioural responses, therefore, we expect gender to moderate the relationships between the study's constructs, thus.

H5. Gender moderates the influence of (a) perceived enjoyment, (b) perceived online self-expressive value, and (c) perceived emotional challenges from gaming on perceived brand coolness.

H6. Gender moderates the influence of perceived brand coolness on brand equity.

4. Methodology

4.1 Data collection and sample collection

Data were collected using online questionnaires distributed through Google Forms. A pilot study was conducted to assess the validity and reliability of the measures, and two experts in the field were consulted to comment on the instrument with no changes deemed necessary. The questionnaire was distributed from January to May 2022 using purposive sampling, which is effective for target samples with specific characteristics and inclusion criteria (Etikan, 2016). Only people with experience in online gaming and those who lived in Malaysia were eligible for participation. After eliminating missing data, unengaged responses, outliers, and participants with no online gaming experience, 160 completed questionnaires were collected. The sample size was determined to be sufficient based on G*Power analysis, with a minimum sample size of 129 needed for a power of 0.95 (Hair *et al.*, 2017a, b), indicating that the sample size requirement was met. Demographic characteristics of the participants are presented in Table 1.

Variable	Frequency	Percentage (%)
<i>Gender</i>		
Male	81	50.6
Female	79	49.4
<i>Age</i>		
15–25	138	86.3
26–41	21	13.1
42–57	1	0.6
<i>The number of playing games in past 12 months</i>		
Few times	55	34.4
A lot	105	65.6

Table 1.
Respondents'
demographics

Source(s): Table denoted by authors

4.2 Method and measures design

The survey began with a brief definition of the study's goals and an introduction to branded games, with examples to establish basic knowledge. A filtering question was then used to categorize the respondents according to their gaming experience. The survey consisted of two sections, the first gathered demographic data such as gender, age, nationality, and the amount of gameplay in the past 12 months. The second section measured each variable in the research framework.

The constructed variables were measured using five-point Likert scale questions ranging from 1 (strongly disagree) to 5 (strongly agree). The items were adapted from the literature, including perceived enjoyment (De Canio *et al.*, 2021), online self-expressive value (Yoo and Park, 2016), emotional challenges (Denisova *et al.*, 2020), brand coolness (Chen and Chou, 2019), and brand equity (Ebrahim, 2020).

4.3 Preliminary analyses

4.3.1 Common method bias mitigation and testing. To minimize common method variance (CMV), the study used self-reported questionnaires, and steps were taken to ensure confidentiality and anonymity. The questionnaire was developed to ensure that the items were clear to the respondents. Maxwell and Harman (1968) single-factor test was conducted and showed no serious issue. Five factors were extracted; the first factor explained 38.44% of the variance, lower than 50%, indicating no CMV issue.

4.3.2 Tests for the reliability and validity of the measurement model. The reliability and validity of the reflective measurement model were assessed and the results are presented in Table 2. The composite reliability values were above the recommended threshold of 0.7, indicating model reliability (Hair *et al.*, 2017). The Average Variance Extracted (AVE) was analysed to confirm convergence validity, which was greater than 0.5, indicating adequate validity. The heterotrait-monotrait (HTMT) correlation ratios, calculated as per Henseler *et al.* (2015) to gauge discriminant validity, were below the critical value of 1, confirming discriminant validity (Table 3).

Construct	Item	Loading	AVE	VIF	Composite reliability
Perceived enjoyment (PE)	PE1	0.854	0.864	1.829	0.950
	PE2	0.882		2.122	
	PE3	0.821		1.626	
Online self-expressive value (SEV)	SEV1	0.881	0.799	2.108	0.923
	SEV2	0.895		2.475	
	SEV3	0.905		2.669	
Perceived emotional challenge (PEC)	PEC1	0.760	0.594	1.615	0.897
	PEC2	0.823		1.994	
	PEC3	0.820		2.186	
	PEC4	0.816		1.976	
	PEC5	0.750		1.676	
Perceived brand coolness (PBC)	PBC1	0.837	0.705	2.299	0.923
	PBC2	0.764		1.749	
	PBC3	0.878		2.870	
	PBC4	0.878		2.908	
	PBC5	0.835		2.380	
Brand equity (BE)	BE1	0.920	0.727	3.066	0.889
	BE2	0.931		3.527	
	BE3	0.937		3.755	

Source(s): Table denoted by authors

Table 2.
Construct reliability
and validity

5. Results

5.1 Estimation of the structural model

After conducting preliminary analyses, the structural model was evaluated for collinearity using the variance inflation factor (VIF) to confirm the absence of multicollinearity issues. The VIF for each item was less than the recommended threshold of 5. The R-squared values and the significance of the path coefficients were used to evaluate the model (Hair *et al.*, 2017a, b). The model had considerable explanatory power since perceived enjoyment, self-expressive value, and emotional challenge combined explained 58.3% of the variance in perceived brand coolness, which in turn explained 44.2% of the variance in brand equity (Table 4). A partial least squares (PLS) algorithm was used to estimate the path coefficients, and a bootstrapping method was used to test their statistical significance (Hair *et al.*, 2017a, b). The results support the direct hypotheses (H1, H2, and H4); however, (H3) was not supported (Table 5).

5.2 Moderation analysis

To examine moderation effects, we treated gender as a categorical moderator with values of 'male' and 'female.' We employed PLS multigroup analysis (MGA) to determine the variations in path coefficients for both genders (Sarstedt *et al.*, 2011). The results in Table 6 demonstrate significant gender differences in the path coefficients between online self-expressive value, perceived emotional challenge, and perceived brand coolness (supporting H5b and H5c). However, the gender differences in the path coefficients between perceived enjoyment and perceived brand coolness and between perceived brand coolness and brand equity were not significant, thereby failing to support H5a and H6 (Table 6).

Construct	BE	PBC	PEC	PE	SEV
BE					
PBC	0.780				
PEC	0.723	0.708			
PE	0.631	0.762	0.713		
SEV	0.714	0.745	0.863	0.658	

Table 3.
Discriminant validity
HTMT ratio

Note(s): BE, Brand equity; PBC, Perceived brand coolness; PEC, Perceived emotional challenge; PE, Perceived enjoyment; SEV, Online self-expressive value
Source(s): Table denoted by authors

Endogenous	R^2
Perceived brand coolness	0.583
Brand equity	0.442

Table 4.
 R^2

Source(s): Table denoted by authors

Hypothesis	Path	Path coefficient(β)	SE	<i>T</i> -statistics	<i>p</i> -values	Decision
H1	PE \rightarrow PBC	0.436	0.083	5.279	0.000	Supported
H2	SEV \rightarrow PBC	0.328	0.087	3.764	0.000	Supported
H3	PEC \rightarrow PBC	0.101	0.106	0.951	0.342	Not Supported
H4	PBC \rightarrow BE	0.665	0.056	11.908	0.000	Supported

Table 5.
Hypothesis testing

Note(s): PE, Perceived enjoyment; PBC, Perceived brand coolness; SEV, Online self-expressive value; PEC, Perceived emotional challenge; BE, Brand equity
Source(s): Table denoted by authors

Hypothesis	Path	PC difference (male vs female)	<i>p</i> -value PLS- MGA	<i>p</i> -value parametric	<i>p</i> -value Welch- Satterthwait	Decision
H5a	PEàPBC	0.050	0.761	0.749	0.751	Not Supported
H5b	SEV à PBC	−0.371	0.032	0.028	0.030	Supported
H5c	PEC à PBC	0.434	0.025	0.024	0.026	Supported
H5d	PBC à BE	−0.190	0.087	0.028	0.030	Not Supported

Note(s): In Henseler's MGA method, the *p*-value lower than 0.05 or higher than 0.95 indicates the 5% level significant differences between specific path coefficients across two groups; $p < 0.10$

PC, Path coefficient; PE, Perceived enjoyment; PBC, Perceived brand coolness; SEV, Online self-expressive value; PEC, Perceived emotional challenge; BE, Brand equity

Source(s): Table denoted by authors

Table 6.
Results of the gender
multigroup analysis
hypothesis testing

6. Discussion

Asia-Pacific is a vital market in the gaming industry due to its large gaming consumer base, while retailers invest in immersive gaming experiences to expand consumers' stays in physical and digital stores and increase their engagement and, potentially, their purchases (Salem and Alanadoly, 2023; Yoo *et al.*, 2023). Meanwhile, McKinsey's 2022 report emphasized the importance of virtual branded fashion and in-game collaborations to engage fashion consumers in the coming five years (Balchandani *et al.*, 2022). On the other hand, Taylor *et al.* (2019) highlighted game-theory as a formal approach to conceptualize decision-making processes in gaming environments. In this emerging research topic, identifying how gaming influences fashion branding strategies and brand reach is an urgent research gap.

This study aims to explore the effects of gaming constructs, including enjoyment, self-expression, and emotional challenges, on consumers' perceptions of brand coolness and its impact on brand equity. The results showed that players of branded games perceived these brands as cool when they experienced enjoyment, self-expression, and emotional challenges. Additionally, the study found that consumers are more likely to be attached to and satisfied with fashion brands when they perceive them as cool, reflecting on their consumption of these brands. These findings align with previous research on luxury brands, which found that a positive perception of brand coolness is related to enjoyable interactions with consumers (Loureiro *et al.*, 2020). On the other hand, brand equity was found to be influenced by consumers' perceptions of brand coolness. Consumers develop awareness, satisfaction, and loyalty towards fashion brands they perceive as cool (Salem *et al.*, 2023a), which impacts their virtual—and maybe physical—consumption of those brands.

Drawing upon game-theory, fashion brands -practically those catering to the younger generations-can enhance consumers' experiences using gameplay strategies, thereby cultivating a perception of 'coolness' around their brands. A closer examination of the Asian market, considering the recent inclination of fashion brands to update their targeting strategies, reveals that integrating immersive gaming into a market characterized by intensive gameplay can profoundly engage consumers, tapping into their preferences, and cultivating lasting loyalty. The burgeoning gaming market in Malaysia, following the lead of the Chinese, Korean, and Japanese markets, presents an opportune landscape for gaming collaborations to emerge, offering compelling branding strategies that resonate with and captivate the Malaysian consumer base. This phenomenon fosters a mutually beneficial

dynamic wherein fashion brands thrive amidst competing markets, while consumers reveal enriched and gratifying immersive brand experiences.

7. Study's implications

7.1 Theoretical implications

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This study extends the theoretical conceptualization of brand coolness by connecting it to Web3 immersive experiences. The findings highlight three main theoretical implications through a comprehensive framework based on game theory. First, the results found that the core values of enjoyment, self-expression, and emotional challenge accounted for nearly 58.3% of the variance in perceived fashion brand coolness. This suggests that creating engaging gaming experiences could enhance brand coolness and significantly drive positive consumer perceptions. Raman (2021) has connected gaming and gamified enjoyment to various marketing constructs, but the present study's novel contribution is linking gameplay enjoyment to brand coolness as a behavioural outcome of brand communication efforts.

Second, the results indicate that brand coolness is directly related to core gaming values and overall fashion brand equity. Gaming values, as strategies in fashion-branded gaming, are significant drivers of brand coolness, and these variables collectively explain 44.2% of brand equity.

Thirdly, female online gamers were found to have a stronger relationship between brand coolness and brand equity as gaming payoffs compared to their male counterparts. Although this finding contradicts those of some studies that have highlighted a higher impact on male gamers (Lier and Breuer, 2020; Polo-Peña *et al.*, 2021), it can be readily understood in the field of fashion, which is mostly dominated by female interests (Ajitha and Sivakumar, 2019; Michon *et al.*, 2007; Raman, 2021). According to our results, female online gamers responded more strongly than male online gamers in terms of their overall equity towards fashion brands.

7.2 Practical implications

This study offers four key insights for practitioners in developing effective marketing and branding strategies. First, the results indicated that all three core values of online games are crucial. However, enjoyment has the most significant impact on brand coolness, followed by self-expression, and emotional challenges. To make their brand appear cool, fashion brands should incorporate online games into their marketing strategies and focus on enhancing enjoyment for their target audience in game development. Additionally, fashion brands can use interactive video games to showcase their collections (Barnett, 2020), which can positively influence brand perceptions.

Second, the relationship between online self-expressive value and brand coolness was proved significant and positive, indicating that brands are likely to be considered cool when consumers can display and reflect their self-image through a game. Games can evoke pleasant feelings and curiosity (Wu *et al.*, 2022) as well as customizing avatars and characters with stylish outfits can boost player enjoyment. Practitioners should collaborate with games that feature different levels of character customizations (outfits, accessories, and beauty attachments) that gamers can relate to, as these strategies can also impact the emotional challenge involved in playing the games, which this study shows can make a large contribution to perceived brand coolness.

Third, the study reveals that gamers' perception of a brand's coolness influences their connection and loyalty to it. Fashion brands can leverage online games to enhance their brand equity by creating and promoting games as a channel to reach target consumers and communicate brand coolness. This can lead gamers to connect with the brand emotionally, spread positive word-of-mouth, and consider the brand a priority option when looking to buy fashion products.

8. Conclusion

In conclusion, this study reveals that interactive/immersive branding, such as in-game collaboration or advergames, affects consumers' perceptions of brand coolness. By providing enjoyable experiences, self-expression opportunities, and emotional involvement through cooperative gaming, fashion brands can enhance perceived coolness, uniqueness, and fun. Gender differences were observed, particularly in female self-expression and emotional challenges in fashion-branded games. These results help understand the coolness of brands in Web3 immersive experiences and have a practical impact on fashion brands' positioning and equity in competitive gaming and fashion markets.

9. Limitations and further research

Despite the valuable contributions of this study, some primary limitations warrant attention in future research. First, while core gaming features were examined with regard to perceived brand coolness, it is essential to recognize that this relationship may be subject to variation when considering other game characteristics. Future research should explore the effects of these features on branded and brand-integrated games, including interface design, usefulness, and ease of use, as proposed by the technology acceptance model.

Second, this study did not cover brand-level factors, such as luxury to mass market segmentation, which could encompass a range of brands from couture to activewear. Future studies could evaluate the influence of branded gaming in different market segments. Third, while the current study focused on Asian consumers, a cross-cultural examination would benefit brands by considering the global presence of both fashion and gaming brands. Fourth, the small sample size may have affected the generalizability of the findings. Future research may consider larger and more diverse samples, representing a wider range of fashion consumers and gaming enthusiasts.

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Expanding career adaptability: connections as a critical component of career success

Expanding
career
adaptability

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Abstract

Purpose – Subjective career success has been widely researched by academics and researchers as it provides job and career satisfaction that can lead to the perceived life satisfaction of employees, as well as their engagement in organizations. This study demonstrates that subjective career success depends not merely on career adaptability but also on the connections people build throughout their professional lives.

Design/methodology/approach – The study was conducted in the socioeconomic context of Latvia with a sample size of 390 respondents. Interpersonal behavioral factors from the perception of career success measure and the influence of the Career Adapt-Abilities Scale (CAAS) on subjective career success (two statements from Gaile *et al.*, 2020) were used. The constructed research model was tested using the SPSS 28 and WarpPLS 8.0 software tools. The primary data analysis method used was partial least squares structural equation modeling (PLS-SEM). Then 12 moderators and their effects on the main relationships of the model were reviewed.

Findings – The study confirms that relationships at work have the most significant effect on subjective career success, followed by control behaviors and curiosity behaviors. Moreover, a list of significant and insightful moderation effects was found, most significantly the relationship between connections and subjective career success.

Originality/value – Until now, the CAAS was not integrated with the behaviors and attitudes that depict the social relationships of individuals at work. This study aims to narrow this gap by exploring whether (and, if so, how) career adaptability and interpersonal relationships in the workplace (i.e. professional connections) contribute to subjective career success.

Keywords Career adaptability, Career success, Social connections, Career construction theory

Paper type Research paper

Introduction

Career success and the role of proactive behaviors in shaping job-related development have been central topics in vocational behavior research (Spurk, 2021). The key prerequisites for maintaining a successful career include, among other factors, one's strengths and core interests

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(Brown and Lent, 2016), career competencies (Presti *et al.*, 2022; Ayoobzadeh, 2022; Francis-Smythe *et al.*, 2012; Kong, 2010; Kuijpers and Scheerens, 2006), one's ability to overcome career hurdles (Ng and Feldman, 2014), the application of a boundaryless career approach (Bartel, 2021; Arthur and Rousseau, 1996), opportunities to follow one's professional calling (Bloom *et al.*, 2021; Praskova *et al.*, 2014) and career adaptability (Savickas and Porfeli, 2012).

The widely used Career Adapt-Abilities Scale (CAAS), grounded in career construction theory by Savickas and Porfeli (2012), portrays individuals as active creators of their work environments. This theory highlights the pivotal role of everyday behaviors and choices in crafting careers. The CAAS centers around four key behaviors, known as the 4 C's – curiosity, concern, confidence and control – that are established antecedents of career success, supported by substantial empirical evidence (Rudolph *et al.*, 2017).

This study bridges a gap by proposing the inclusion of workplace social relationships, labeled as "Connections," as the fifth C in the CAAS. In contrast to prior research, it highlights the overlooked role of moderators in individuals' career construction efforts. Categorizing these moderators into family life, job attributes, company size and demographic characteristics enhances our understanding of the diverse factors influencing career success, complementing the recognized importance of social capital in previous studies (Lin, 1999; Seibert *et al.*, 2001; Chow, 2002; Lo Presti *et al.*, 2019; Sou *et al.*, 2022; Kauffeld and Spurk, 2022; Boat *et al.*, 2022).

The goal of this study is to examine the influence of the CAAS and interpersonal relationships on subjective career success.

The study aims to develop an expanded Subjective Career Success Model by integrating interpersonal behavior with career adaptabilities. Data were collected from 390 individuals through social media platforms in Latvia and subjected to rigorous reliability and validity testing using SPSS 28 and WarpPLS 8.0 (specialized software for structural equation modeling). The findings of the study demonstrate the effectiveness of the newly developed model.

The study concludes that interpersonal relationships significantly impact subjective career success, with sociodemographic factors like age, education and gender acting as moderators. Suggesting an expansion of the CAAS to include a fifth factor, "Connections," the study advocates its use in future career success studies. These nuanced findings serve as a roadmap for individuals and career counselors, emphasizing the suitability of different behaviors in diverse life-cycle situations, considering various sociodemographic and family background factors.

This paper is structured as follows. The literature review depicts the theories of vocational behavior, in particular Savickas and Profeli's theory of career adaptability. Next, the role of interpersonal relationships and connections in career success is explored. The methodology addresses the measurement explanations and research model descriptions of this study. Following this are a discussion and the authors' conclusions.

Literature review

Career Adapt-Ability Scale within theories of vocational behavior

According to Brown and Lent (2016), past vocational behavior research can be classified into three broad areas: (1) agency in career development, (2) equity in the workforce and (3) well-being in work and educational settings. Within the agency category, there is an emphasis on career success and career adaptability. To date, much attention has been paid to human capital within the following topics: career success (Ng *et al.*, 2005; Järnlström *et al.*, 2020), psychological and demographic factors (Lyons *et al.*, 2015; Haenggli and Hirschi, 2020; Zacher, 2014), social capital (Järnlström *et al.*, 2020; Barthauer *et al.*, 2016), organizational support, organization–person fit (Ng and Feldman, 2014), leader–member exchange (e.g. Restubog *et al.*, 2011; Spurk *et al.*, 2014), member–member exchange (Drabe *et al.*, 2015),

performance (Dries *et al.*, 2008) and career adaptability behaviors (Haenggli and Hirschi, 2020; Zacher, 2014) as factors that interplay in the development of a successful career.

Savickas and Porfeli's (2012) CAAS, a recognized antecedent for career success (Rudolph *et al.*, 2017; Zacher, 2014), aligns with the focus on continuous individual activity in career development and success studies. Lee *et al.* (2021) note a lack of widespread criticism for the current CAAS version, establishing its positive impact on individuals and organizations. However, this paper critically examines the CAAS, highlighting its task-focused nature and proposing the inclusion of a fifth "C": connections, acknowledging the undervalued importance of social skills and interpersonal relationships (Rigby and Sanchis, 2006).

Interpersonal relationships (connections) also play a significant role when individuals report their own subjective career success (e.g. Gattiker and Larwood, 1986; Shockley *et al.*, 2016; Ng and Feldman, 2014; Poona *et al.*, 2015). Thus, connections should be added as a separate element to the CAAS to build a more profound and coherent picture of the main factors that lead to career success (which are directly affected by each individual's behavior).

Social capital and interpersonal connections as predictors of career success

The workplace's social context is pivotal for success, especially in customer-centric industries like hospitality, retail, tourism and sales. Relationships stand as one of the three pillars of career success in the pursuit of a boundaryless career (Arthur and Defillippi, 2001), intertwined with motivation (Defillippi and Arthur, 1994).

Interpersonal connections form the nucleus of career success predictors, encompassing trust (Wang, 2014), leader–member exchanges (Restubog *et al.*, 2011; Spurk *et al.*, 2014), member–member exchanges (Drabe *et al.*, 2015), developmental networks (Chollet *et al.*, 2021; Cheung *et al.*, 2016; Cotton *et al.*, 2011; Dobrow *et al.*, 2012), mentoring (Ng and Feldman, 2014; Higgins and Kram, 2001; Lancau and Scandura, 2002; Kong, 2010; Defillippi and Arthur, 1994) and sponsored mobility (Maurer and Chapman, 2013).

Numerous studies underscore how social capital impacts executive compensation (Belliveau *et al.*, 1996; Burt, 1997), reduces turnover rates (Krackhardt and Hanson, 1993) and influences career orientations, especially for women (Rodrigues *et al.*, 2019; Choi, 2019). Recent research extends this impact to the career and development outcomes of HR professionals (Gubbins and Garavan, 2016).

Subjective career success

Career success, encompassing job aspects, finances, interpersonal relationships, personal lives, learning and development, is influenced by an individual's raised life standard and educational level, leading to varied needs (Harrington and Hall, 2007). This shift in understanding subjective career success emphasizes overall job and career satisfaction. Vocational behavior plays a crucial role in achieving the desired outcome of subjective career success.

Possible moderators of subjective career success

Recognizing the complexity of career behavior, the authors employ moderators to assess intervention effects across diverse research sample groups (MacKinnon, 2011). Previous studies highlight demographic factors, such as age (Van der Heijden *et al.*, 2022), gender (Fernandez *et al.*, 2023) and marital status (Agrawal and Singh, 2022), influencing subjective career success. To address this, employers are adopting work–family enrichment options (Awan *et al.*, 2021) and age-adjusted human resource development policies (Van der Heijden *et al.*, 2022).

Job satisfaction has always been related to subjective career success, but it remains debated whether job satisfaction leads to perceived career success (Drabe *et al.*, 2015; Schwormal *et al.*, 2017) or subjective career success leads to job satisfaction (Lehtonen *et al.*, 2022; Sou *et al.*, 2022). Education is the foundation for the individual's profession and perceived self-worth in the labor market (Duta *et al.*, 2021; Hildenbrand, 2015; Sönmez *et al.*, 2021). Education makes job crafting possible, which lately has been introduced as an antecedent of subjective career success (Kundi *et al.*, 2022; Lo Presti *et al.*, 2023).

Microenvironments and macroenvironments impact individuals' career satisfaction. Family influence, while potentially contributing to career success, may also hinder it if career-building overshadows family commitments (Liu and Yu, 2021). Organizations, as a microenvironment, offer career resources like networking and mentoring, fostering career success through enhanced learning and professional growth opportunities (Agrawal and Singh, 2022; Lehtonen *et al.*, 2022). Larger organizations, with increased resources, are positioned to provide better support for successful careers.

Considering the macroenvironment is crucial in evaluating career success. Socioeconomic status, global income inequality and dependence on institutional capital like cities are pivotal factors (Awan *et al.*, 2021; Bagdadli *et al.*, 2021; Fernandez *et al.*, 2023; Guo and Baruch, 2021). Unemployment experience, tied to macroeconomic shifts, significantly impacts individuals' employability and career success (Manzoni and Mooi-Reci, 2020; Borgen *et al.*, 2021).

The study's moderators fall into four groups:

- (1) Family-related factors (marital status, number of children, proportional contribution to family budget and previous unemployment experience).
- (2) Job-related factors (total work experience, years in a current position, current monthly salary level, liking a current job from the start and education).
- (3) Organizational attribute (company size).
- (4) Demographic characteristics (gender and age).

The methodology applied for the research is outlined in the next section, and the application of these moderators is designed to increase the practicality of the study.

Methodology

Subjective Career Success model has been created. It includes the Savickas and Porfeli (2012) CAAS behaviours: concern, control, curiosity and confidence, and interpersonal behavior (connection) behaviours by Gattiker and Larwood (1986). All statements were measured using the ten-point Likert scale, which has a higher validity and explanatory power than the five-point Likert scale suggested by Coelho and Esteves (2007).

Finally, subjective career success was measured in accordance with Gaile *et al.* (2020) by using two statements: "To what extent are you satisfied with your job?" from Colakoglu (2011), Converse *et al.* (2014) and Verbruggen *et al.* (2015), and "I am satisfied with the success of my career" from Greenhaus *et al.* (1990). A calculated Cronbach's alpha with a value of 0.768 indicates good internal consistency for the construct of this factor.

The study data were collected in April 2020 by inviting people from different backgrounds via social media platforms, such as LinkedIn and Facebook. The questionnaire was written in Latvian, suggesting that the results can be attributed to Latvia's socioeconomic context. A total of 390 valid responses were obtained. Table 1 details the study sample descriptions.

The constructs' reliability and validity were assessed using SPSS 28 (Statistical Package for the Social Sciences). Subsequently, a mathematical model was implemented in WarpPLS 8.0, a user-friendly software package for variance- and factor-based structural equation

Total number of respondents: 390		#	%	Expanding career adaptability	415
Gender	Female	283	72.56		
	Male	107	27.44		
Age	Range		23–67		
	Mean		40.07		
	S.D.		9.65		
Education	Primary school	2	0.51		
	Secondary school	40	10.26		
	Bachelor's degree	104	26.67		
	Master's degree	229	58.72		
	Doctoral degree	15	3.85		
Marital status	Not married	174	44.62		
	Married	216	55.38		
Children	Range		0–5		
	Mean		1.04		
	S.D.		1.1		
Contribution to family budget (%)	Range		10–100		
	Mean		64.09		
	S.D.		25.30		
Salary level (EUR)	500 or less	0	0.00		
	501–1,000	101	25.90		
	1,001–2,000	177	45.38		
	2,001–5,000	85	21.79		
	More than 5,000	27	6.92		
Company size	Solo	25	6.41		
	Small	106	27.18		
	Midsized	112	28.72		
	Large	147	37.69		
Liking current job at its start (Likert-10)	Range		0–10		
	Mean		7.82		
	S.D.		1.76		
Years in current position	Range		0–44		
	Mean		5.63		
	S.D.		6.14		
Total work experience (years)	Range		0–50		
	Mean		18.93		
	S.D.		9.75		
Unemployment experience	Yes	214	54.87		
	No	176	45.13		
Source(s): Authors				Table 1. Study's sample descriptives	

modeling (SEM) employing the partial least squares method (PLS), as recommended by Hair *et al.* (2014). PLS-SEM is a widely accepted method for exploratory research in various fields, including management and organizational development (Al-Emran *et al.*, 2018; Kock and Hadaya, 2018).

WarpPLS, a software program developed by ScriptWarp Systems, is a powerful tool for predictive PLS-SEM cases rooted in established theories (Hair *et al.*, 2014). Notably, for exploratory research, PLS-SEM is favored (Kock and Hadaya, 2018), and WarpPLS stands out by allowing the explicit identification of nonlinear functions connecting latent variables in SEM models and calculating associated multivariate coefficients of association, a capability unique to this software (Kock, 2010). Unlike other tools that offer solely linear functions, WarpPLS is the first to provide classic PLS algorithms alongside factor-based PLS algorithms for SEM (Kock, 2019).

Research model

Figure 1 presents the initial research model, which contains the interpersonal behavior construct (connections) as well as the four career adaptabilities constructs (control, curiosity, confidence and concern). This reflects the starting point for the research meta-model in this paper and the key constructs for further PLS-SEM analysis.

The general PLS-SEM analysis results include model fit and quality indexes: average path coefficient (APC), average R-squared (ARS), average adjusted R-squared (AARS), average block variance inflation factor (AVIF) and average full collinearity VIF (AFVIF). It is recommended that the p values (significance) for APC, ARS and AARS should all be equal to or lower than 0.05; this was the case for the main research model (APC = 0.220, $p < 0.001$; ARS = 0.410, $p < 0.001$; AARS = 0.402, and $p < 0.001$). Ideally, both AVIF and AFVIF should be equal to or lower than 3.3 (particularly in models where most of the constructs are measured through two or more indicators); this was true for the model used (AVIF = 1.699 and AFVIF = 1.863).

Measurement model: reliability and validity

To ensure the validity and reliability of the reflective measurement model, various tests were conducted using the most frequent techniques according to Ringle *et al.* (2012). Thus, the internal consistency reliability with Cronbach's alpha (CA) and composite reliability (CR), the convergent validity with the average extracted variance (AVE) and the discriminant validity with the Fornell-Larcker criterion (Ringle *et al.*, 2012) were tested. Validity indicates the degree to which a measurement model can predict what will be measured. By contrast, reliability checks the degree to which the same measured values lead to the same results; this represents the failure rate (Burns and Burns, 2008; Weiber and Mülhhaus, 2014).

In the beginning, the internal consistency reliability was tested (for which the average correlation of all of the individual items of the same construct are compared). Thus, this shows the accuracy of a group of variables or items measuring a latent variable. Internal consistency reliability is mostly measured with CA and CR (Ringle *et al.*, 2012). The higher the values of CA and CR, the more congruent the items (ergo, the higher the internal reliability). In the model, the CA of all the constructs was considerably greater than 0.7 (Table 2), which is mentioned as the threshold. The CR should have a value of at least 0.6, which is reflected in the current model values in Table 2 (ranging from 0.855 to 0.903) (Weiber and Mülhhaus, 2014). Thus, this model is internally reliable.

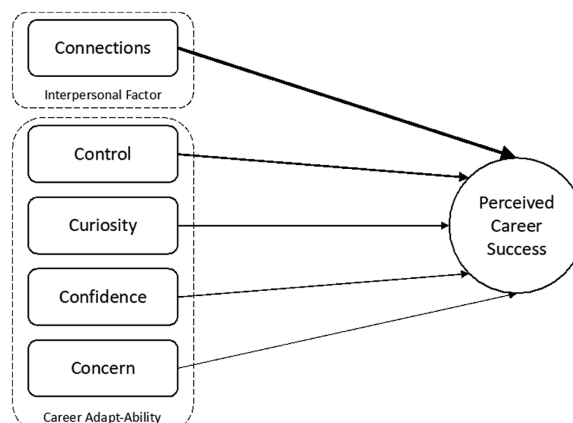


Figure 1.
Subjective career
success model of study

Source(s): Authors

Regarding testing the convergent validity, AVE was used; this determined the average percentage of the items that explain the dispersion of the latent construct. In the literature, a threshold of 0.5 is mentioned for this factor (Fornell and Larcker, 1981; Bagozzi and Yi, 1988); this was the case for all the constructs in the model (Table 2). Lastly, the discriminant validity with the Fornell–Larcker criterion (Fornell and Larcker, 1981) was checked. Therefore, the square root of each AVE in a diagonal must be compared with the correlation coefficients for each construct. Table 2 shows that the AVE was higher in each case in the model, so the discriminant validity is accepted. Table 3 provides structure loadings and cross-loadings for deeper insights into the construct's reliability and validity.

	CR	CA	AVE	PCS	CONN	CONT	CURI	CONF	CONC
PCS	0.896	0.768	0.811	<i>0.901</i>	0.511	0.389	0.114	0.268	0.251
CONN	0.881	0.797	0.712	0.511	<i>0.844</i>	0.353	0.140	0.234	0.248
CONT	0.860	0.803	0.506	0.389	0.353	<i>0.712</i>	0.511	0.562	0.468
CURI	0.855	0.788	0.543	0.114	0.140	0.511	<i>0.737</i>	0.666	0.634
CONF	0.903	0.871	0.609	0.268	0.234	0.562	0.666	<i>0.780</i>	0.461
CONC	0.890	0.844	0.619	0.251	0.248	0.468	0.634	0.461	<i>0.787</i>

Note(s): (CR: composite reliability; CA: Cronbach's alpha; AVE: average variance extracted) as well as inter-construct correlation matrix (with square roots of AVEs shown in italic on diagonal)

Source(s): Authors

Table 2.
Reliability and validity
measures

	PCS	CONN	CONT	CURI	CONF	CONC
PCS1	<i>0.901</i>	0.466	0.367	0.113	0.245	0.223
PCS2	<i>0.901</i>	0.456	0.333	0.092	0.238	0.23
CONN1	0.447	<i>0.844</i>	0.355	0.146	0.251	0.239
CONN2	0.458	<i>0.865</i>	0.317	0.108	0.18	0.212
CONN4	0.387	<i>0.821</i>	0.217	0.1	0.16	0.175
CONT1	0.493	0.362	<i>0.632</i>	0.231	0.321	0.423
CONT2	0.292	0.281	<i>0.767</i>	0.41	0.384	0.393
CONT3	0.267	0.273	<i>0.773</i>	0.465	0.539	0.37
CONT4	0.124	0.146	<i>0.699</i>	0.339	0.327	0.236
CONT5	0.267	0.281	<i>0.733</i>	0.386	0.492	0.305
CONT6	0.24	0.164	<i>0.653</i>	0.326	0.312	0.273
CURI1	0.025	0.003	0.337	<i>0.759</i>	0.365	0.458
CURI2	0.116	0.115	0.38	<i>0.809</i>	0.48	0.583
CURI3	0.107	0.163	0.441	<i>0.67</i>	0.445	0.403
CURI4	0.253	0.234	0.46	<i>0.713</i>	0.669	0.407
CURI6	−0.077	0.011	0.277	<i>0.726</i>	0.508	0.472
CONF1	0.229	0.222	0.403	0.436	<i>0.739</i>	0.28
CONF2	0.216	0.211	0.42	0.454	<i>0.73</i>	0.242
CONF3	0.173	0.128	0.429	0.635	<i>0.788</i>	0.487
CONF4	0.197	0.114	0.384	0.563	<i>0.779</i>	0.428
CONF5	0.162	0.203	0.461	0.527	<i>0.837</i>	0.35
CONF6	0.283	0.22	0.529	0.499	<i>0.806</i>	0.363
CONC1	−0.007	0.069	0.135	0.43	0.212	<i>0.734</i>
CONC2	0.143	0.148	0.276	0.441	0.3	<i>0.753</i>
COCN3	0.234	0.206	0.437	0.52	0.43	<i>0.842</i>
CONC4	0.259	0.218	0.458	0.487	0.353	<i>0.744</i>
CONC5	0.336	0.315	0.508	0.604	0.494	<i>0.851</i>

Source(s): Authors

Table 3.
Structure loadings and
cross-loadings

Results

The study results in this section are presented in three sub-sections. The first describes the main model, as well as the key relationships between the dependent variable of the subjective career success and the independent variables of connections (control, curiosity, confidence and concern). The second outlines the statistically significant moderating effects of the 12 variables (Table 4) on the main relationships in the research model. The third explores how the significant moderating effects altered the relational strengths among the independent and dependent constructs.

Main model

The main results of the structural model are presented in Figure 2. The β values that are noted next to each arrow demonstrate the strength of the relationships among the constructs, and the asterisks mark their statistical significance (the R^2 contributions are presented in brackets). All the paths in the model are statistically significant. The model visibly demonstrates how significantly strong the effect of the connections is on explaining subjective career success ($\beta = 0.412, p < 0.001$). This is especially true when comparing it with the path coefficients of the other four constructs that represent the career adaptability factors ($\beta = 0.236\text{--}0.117, p < 0.001\text{--}0.050$).

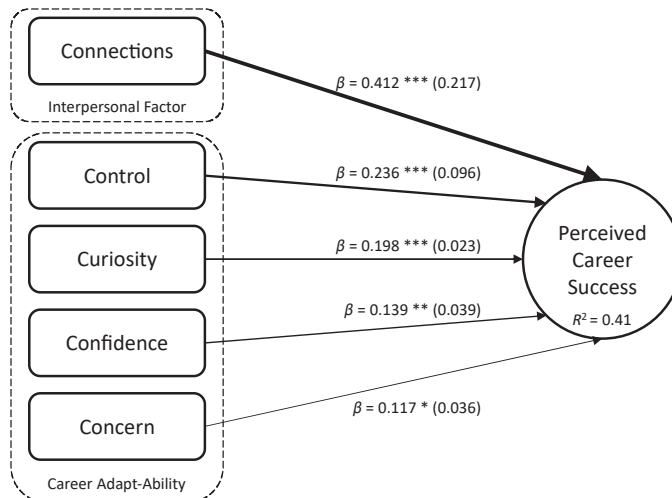
The total effects and effect sizes are also provided in Figure 2. The effect sizes (f^2) determine whether the effects indicated by the path coefficients are small (0.02), medium (0.15) or large (0.35). This study reveals that relationships at work (connections) dominate in the size of their effect on subjective career success ($f^2 = 0.217$) as compared to the effect sizes of the other four constructs ($f^2 = 0.096\text{--}0.023$) related to the CAAS. The current model in Figure 2 portrays the differences by changing the arrow sizes and thicknesses accordingly.

Of the four career adaptability factors, control had the strongest predictive power on subjective career success ($\beta = 0.236, p < 0.001$), with a medium to small effect size ($f^2 = 0.096$). The next largest effect on subjective career success ($\beta = 0.198, p < 0.001$) came

	CONN → PCS	CONT → PCS	CURI → PCS	CONF → PCS	CONC → PCS
Marital	$\beta = 0.160^{***}$ $p < 0.001$		$\beta = -0.090^*$ $p = 0.036$		
Children	$\beta = -0.147^{**}$ $p = 0.002$			$\beta = -0.099^*$ $p = 0.024$	
FamilyBudget	$\beta = 0.100^*$ $p = 0.023$				
Unemployment	$\beta = 0.195^{***}$ $p < 0.001$				
YearsTotal				$\beta = -0.094^*$ $p = 0.030$	
YearsCurrent	–	–	–	–	–
Salary	–	–	–	–	–
LikeStart	$\beta = -0.193^{***}$ $p < 0.001$				
Education	$\beta = -0.085^*$ $p = 0.045$		$\beta = -0.104^*$ $p = 0.019$		
CompanySize	$\beta = -0.107^*$ $p = 0.016$				
Gender	$\beta = 0.087^*$ $p = 0.042$				
Age	$\beta = 0.095^*$ $p = 0.028$				

Table 4.
Overview of
moderating effects in
main research model

Source(s): Authors



Note(s): $p^* < 0.05$; $p^{**} < 0.01$; $p^{***} < 0.001$

Source(s): Authors

Figure 2.
Research model with
values from PLS-SEM
analysis

from curiosity, with a small effect size ($f^2 = 0.023$). The effect of confidence ($f^2 = 0.039$) and concern ($f^2 = 0.036$) on subjective career success is minimal. The strengths of these relationships, however, were comparatively the weakest in the model, with confidence ($\beta = 0.139, p < 0.01$) being slightly stronger than concern ($\beta = 0.117, p < 0.05$) in predicting subjective career success for the study sample.

The coefficient of the determination value (R^2) indicates the model's ability to explain and predict the constructs (Ringle *et al.*, 2012). The R^2 of the overall model was 41%, which shows quite a good predictive accuracy according to Hair *et al.* (2014). As the model's value is around 50%, this indicates that the measurements fit well to the model and that the independent variables explain the variance of the dependent variable quite effectively.

Moderating effects

In a further analysis, the potential effects of the moderators (Table 4) on the main relationships of the research model were investigated. In PLS-SEM analysis, moderating effects provide deeper and richer insights into how various factors might influence the strengths of model relationships. Typically, there are three ways they do this: a moderator increases, decreases or has no significant effect on a relationship in a model. Figure 3 presents a conceptual version of the research model by portraying an example of a moderator and its relational effect on the main paths of the research model.

Each moderator was analyzed separately to gain insights into its effects on the main model relationships. The 12 moderators of this study (Table 4) were as follows: marital status (Marital), number of children (Children), proportional contribution to family budget (FamilyBudget), previous unemployment experience (Unemployment), total work experience in years (YearsTotal), years in current position (YearsCurrent), current monthly salary level (Salary), liking one's current job from the start (LikeStart), education level (Education), company size (CompanySize), gender of the individual (Gender) and age (Age). After running the analysis with the 12 moderators, all the significant moderating effects were summarized. Table 4 shows this summary, along with the moderators' strengths (β values) and levels of significance (p values).

Figure 3.
Research model with
moderating effects

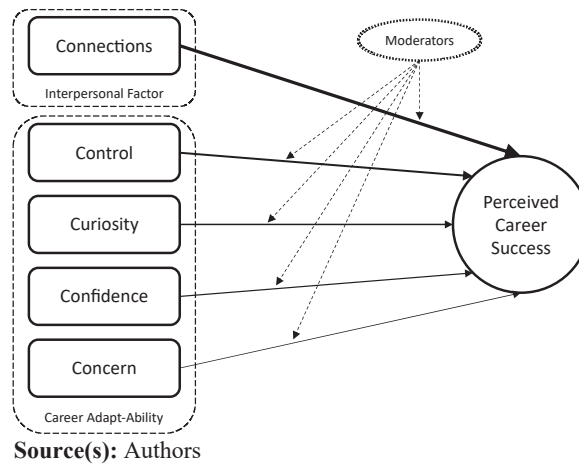


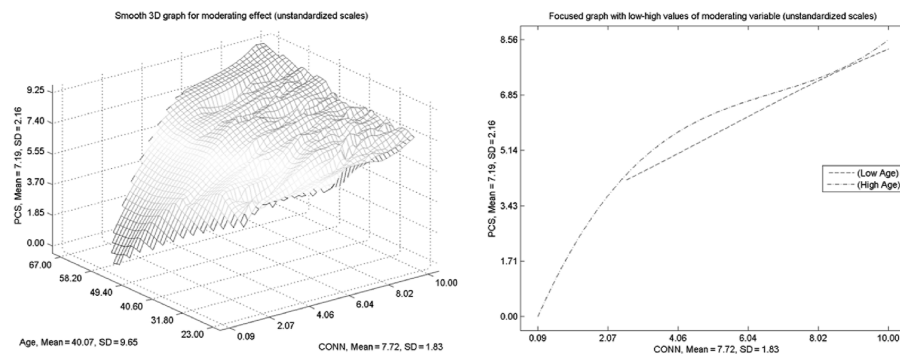
Table 4 provides clear evidence that the relationship between connections and subjective career success had the widest variety of significant moderating effects (both positive and negative). Not only did connections have the greatest effect on explaining individuals' subjective career success, but they also had the highest sensitivity regarding many personal and contextual parameters. The relationships that control and concern behaviors have with subjective career success had no significant moderating effects according to this study. The importance of curiosity behaviors for subjective career success was negatively moderated by both the marital status (Marital) and educational level (Education) of an individual. Similarly, the importance of confidence behaviors in determining subjective career success was also negatively moderated by two factors: one's number of children (Children) and total work experience in years (YearsTotal).

Deeper exploration of moderating effects

In this exploratory research, the WarpPLS software offered a unique opportunity to investigate the nonlinear functions of moderating effects on the connecting pairs of latent variables. Therefore, deeper and richer insights into some of the most interesting moderating effects are shared in this section.

Positive moderating effects on CONN > PCS relationship. First, Figure 4 provides a closer look into the moderating effect of age on the CONN > PCS relationship. The 3D graph visually

Figure 4.
Positive moderating
effect of age on
relationship between
connections and
subjective career
success



Source(s): Authors

portrays how the effect of connections on subjective career success increases with age. The turning point is somewhere around 50 years of age. In the focused graph, a difference between the younger and older generations of the respondents is depicted.

Figure 5 provides deeper insights into the moderating effect of the proportional contribution to the family budget on the relationship between connections and subjective career success. A significant increase happens at around the levels of 60 and 80% of the proportional contributions. The focused graph depicts the difference between the groups of respondents depending on low vs high degrees of proportional contributions to the family budget.

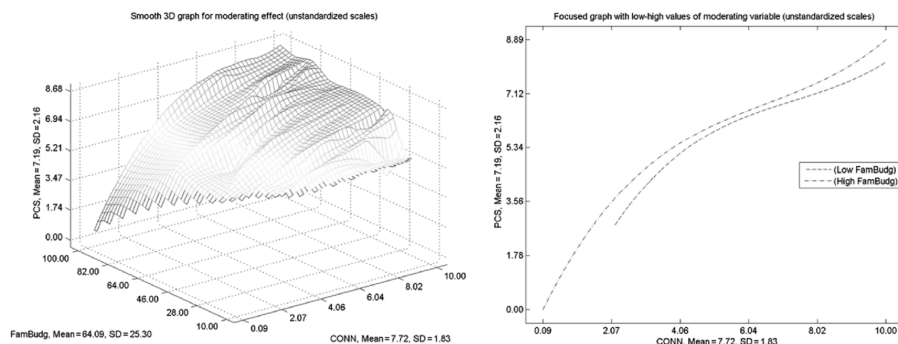
Discussion

In the career-management domain, the predominant focus revolves around choosing a profession aligned with personal aspirations. This study emphasizes a crucial question: “What kind of people am I willing to work with?” This adds a significant theoretical dimension to subjective career success. Notably, relationships at work wield greater influence ($\beta = 0.412, p < 0.001$) than career adaptability factors ($\beta = 0.236\text{--}0.117, p < 0.001\text{--}0.05$) on individuals’ perceived career success. Moderators like years in the current position and current monthly salary show no significant effect, possibly due to their short-term nature, aligning with counterintuitive findings on pay level and job satisfaction from previous research (Judge *et al.*, 2010).

A noteworthy discovery is that control and concern behaviors’ relational effects on subjective career success remained unaffected by any moderator. The study indicates a general trend where career adaptability behaviors’ relational effects on subjective career success were less influenced by moderators than the effects on subjective career success. This suggests that adaptability, focusing on internal self-regulation strategies, differs from relationships at work, which reflect external (social) behaviors.

The study indicates that higher education fosters independence, reducing reliance on work relationships. Conversely, work connections hold significant importance for less-educated individuals in perceiving career success. Additionally, a negative moderating effect among more-educated respondents was observed in the relationship between curiosity and subjective career success. This suggests that higher education may lead to elevated career expectations, potentially resulting in lower career satisfaction due to a misalignment with market realities.

Confidence has a diminished impact on subjective career success with increased work experience, suggesting its greater relevance in early career stages. This intriguing finding



Source(s): Authors

Figure 5.
Positive moderating
effect of proportional
contribution to family
budget on relationship
between connections
and subjective career
success

suggests a need for future studies exploring distinct sets of career adaptability behaviors at different life stages. Notably, this aligns with age, where older and more experienced individuals prioritize connections at work over career adaptability behaviors in influencing subjective career success.

Respondents who initially enjoyed their jobs experienced a diminished impact of work connections on subjective career success. This suggests relationships may serve as a compensatory mechanism for those with lower initial job satisfaction. Another unexpected finding is that connections at work have a stronger effect on subjective career success for those without prior unemployment experience. Speculatively, unemployment trauma might diminish the belief in relationships, making positive work connections less influential in determining subjective career success.

Married individuals attribute greater importance to work relationships for subjective career success compared to unmarried counterparts. This could be tied to the younger age and limited work experience of unmarried individuals, making workplace connections less significant. Alternatively, unmarried individuals may face psychological barriers in forming connections, diminishing the overall importance of relationships, including at work.

Respondents with more children experience diminished effects of work connections and confidence behaviors on subjective career success. This suggests a shift in focus away from career priorities, potentially leading to reduced emphasis on behavioral or external factors. It also implies that family relationships may compete with work relationships for these individuals.

Respondents contributing more to the family budget and prioritizing work relationships experience increased subjective career success. For this group, concern behaviors play a crucial role, reflecting their heightened responsibility for dependents.

In larger companies, work relationships exert less influence on subjective career success compared to smaller counterparts. This is attributed to the dominance of a “formal organization” in larger organizations, where colleague relationships are less crucial. In contrast, smaller organizations, characterized by a more flexible “informal organization” (Child and Mansfield, 1972), place a higher importance on relationships between colleagues, aligning with theories of market and hierarchical coordination by Thompson (2003).

This study acknowledges limitations inherent in its methodology, particularly the reliance on an online survey that may introduce a self-selection bias toward digitally savvy white-collar workers. Geographical constraints also limit the generalizability of results beyond the specific location studied, despite efforts to ensure sample diversity. While the study boasts a satisfactory sample size, the acknowledgment of the potential benefits of larger samples highlights a trade-off in statistical power and precision. Despite these constraints, the study offers valuable insights for future research and practical applications in organizational settings, emphasizing the need for contextualized interpretation within the study’s parameters.

Conclusions

This study highlights that workplace relationships play a more significant role in predicting subjective career success than Career Adaptability Assessment System (CAAS) behaviors. Various personal and contextual factors influence the importance of these relationships, offering nuanced insights into career-development strategies.

The study introduces the concept of the “fifth C” – connections – as a crucial factor in CAAS, influencing subjective career success. Intriguingly, connections exhibit a negative effect on subjective career success for highly educated individuals, suggesting diverse career strategies based on life stages, family situations and sociodemographic factors.

Education negatively moderates the relationship between curiosity behaviors and subjective career success, possibly due to heightened expectations accompanying higher

education. Job attractiveness at the start and unemployment experience also moderate the impact of connections on subjective career success.

These findings imply that tailored career strategies are essential, considering individual variations in family situation, age, experience and education. Organizations can create more opportunities for relationship-building, especially for less-educated and younger employees. Acknowledging that investments in workplace relationships can enhance or distract from career success, this study opens avenues for future research and provides valuable insights for individuals, career counselors and HR managers aiming for more meaningful and fulfilling careers.

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Toward a sustainable research agenda on food eco-labelling in the business and management research domain

Food
eco-labelling
research
agenda

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Abstract

Purpose – This study aims to critically review the research on food eco-labels to identify research gaps and recommend future research directions in business and management.

Design/methodology/approach – A hybrid integrated review combines bibliometric analysis with an in-depth framework-based study of theory–context–characteristics–methodology (TCCM) and reviews quality research published over 21 years between 2002 and 2022.

Findings – We identify key research themes and the knowledge structure of food eco-label research. Future researchers should explore food eco-label dynamics and phenomena in areas related to consumer behaviour, information, consumer knowledge, environmental concerns, trust, packaging and willingness-to-pay as antecedent factors.

Research limitations/implications – This review contributes to the business and management literature by quantifying existing research and consolidating its evolution. The articles were sourced from the established Web of Science (WoS) database. Other databases should be included in future reviews. We also focus on research published in business and management. Further studies could include research beyond such specialised domains.

Practical implications – Consumers need more information on the objectives and meaning of food eco-labels. The dissemination of knowledge on eco-labels, as well as effective communication and information on eco-labels, are relevant to future research issues.

Social implications – The knowledge derived from this research holds significant potential in shaping policies and devising tools aimed at reducing the carbon footprint linked to food production and consumption.

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Considering the substantial impact of these activities on our planet's carbon footprint, addressing food security and sustainability emerges as a crucial concern for humanity. Recognising the importance of eco-label communication and information becomes particularly pertinent for future generations, who stand to bear the most substantial impact of climate change and sustainable development. These generations are also more inclined toward embracing and implementing sustainable practices.

Originality/value – There are no comprehensive, integrated reviews exploring the methods, variables and constructs used in studies on food eco-labels based on all articles published in WoS journals in the business and management domains. This is the first comprehensive literature review using a hybrid approach (bibliometric review with TCCM framework) in the field of food eco-label research.

Keywords Eco-label, Food, Sustainability, TCCM, Bibliometric analysis, Marketing

Paper type Research paper

1. Introduction

Environmental sustainability poses a critical challenge for humanity. Growing environmental initiatives align with public concern and consumer activism, pressuring politicians and businesses to prioritise responsible production and consumption. Food consumption, accounting for a third of households' environmental impact, plays a crucial role. Its production generates a similar share of human-caused greenhouse gases. Calls for agricultural sustainability and the significance of sustainable supplier selection for company performance are emphasised by various authors (Crippa *et al.*, 2021; Aliabadi *et al.*, 2022).

Eco-labels inform buyers about sustainability, impacting their choices. Few studies on food eco-labels exist. Manta *et al.* (2023) suggest exploring eco-label roles in local development. Dórea *et al.* (2022) emphasise consumer influence on environmental labels. Maesano *et al.* (2019) advocate examining social and economic sustainability. Notably, these studies cover diverse sectors but not specifically agri-food products.

The only study to focus on a research area is Maesano *et al.* (2019), who focused on social sciences. To fill these research gaps, this study focuses on food eco-labels in the business and management research domains.

We analyse food product eco-label research from business and management journals using the Web of Science (WoS) database. We scrutinise studies between 2002 and 2022 with keywords like “ecolabel*”, “eco-label*”, “sustainab* label*”, “eco-friendly label*”, “environmental label” and “food” in titles, abstracts or keywords. Results are refined based on business and management subject area, journal source and English language.

We performed a bibliometric analysis, reviewing 32 research papers using the theory–context–characteristics–methodology (TCCM) approach (Paul and Rosado-Serrano, 2019). This approach differs from previous studies by providing comprehensive insights beyond typical bibliometric descriptions. Our analysis delves into thematic and co-occurrence keywords, addressing future research challenges, in contrast to prior studies focussing on variables like authors, countries and keywords (Chen *et al.*, 2023; Lim *et al.*, 2021; Mandler *et al.*, 2021; Paul *et al.*, 2021).

Dórea *et al.* (2022) and Manta *et al.* (2023) explored environmental/sustainable labelling but not within the food sector or a specific research domain. In contrast, Maesano *et al.* (2019) exclusively studied the wine sector. This gap prompts overarching questions to be addressed.

RQ1. What is the structure of research on food eco-labels in the business and management research domains?

RQ2. What are the research gaps in the existing literature, and what are avenues for future research in the field of food eco-labels in these domains?

The paper's structure is as follows: Section 2 reviews relevant literature on eco-labels in food contexts. Section 3 details our hybrid review method and the bibliometric/TCCM approaches used. Section 4 reveals the findings. Section 5 consolidates our discussion, summarising state-

of-the-art methods. Furthermore, it outlines future research paths, potential limitations and concludes by emphasising managerial and social implications.

2. Literature review

Participation in eco-labelling schemes, as noted by Gulbrandsen (2006), allows companies to address diverse stakeholders – environmental groups, governments, retailers and eco-conscious consumers. Eco-labels communicate qualities not evident during consumption (Rao *et al.*, 1999) and visually highlight a product's green attributes in business terms (Thøgersen *et al.*, 2010). The role of eco-labels varies based on stakeholders' perspectives (Bratt *et al.*, 2011), serving as a benchmark for improvement and competitiveness from a producer's viewpoint.

Consumer-focused eco-labels serve as information channels and tools for spreading awareness within the market. They communicate positive environmental and social impacts while reducing uncertainty in consumers' environmentally conscious purchases (Donato and Adigüzel, 2022). Lee *et al.* (2020) highlighted that sustainable labels aim to prioritise environmentally friendly products, categorising their impact into three key areas: reducing environmental impact, influencing consumer awareness and attitudes, and changing consumption behaviour.

Despite various studies on ecolabel adoption and outcomes, comprehensive reviews in the food sector, particularly within business and management journals, are limited. Existing research primarily originates from journals focused on food policy, sustainability, environmental studies and government policy papers (Grunert *et al.*, 2014; Leach *et al.*, 2016; Riskos *et al.*, 2021; Stein and de Lima, 2022; Narciso and Fonte, 2021). Additionally, reviews by Asioli *et al.* (2020), Potter *et al.* (2021) and Prieto-Sandoval *et al.* (2016) encompass literature from diverse fields such as agricultural economics, environmental studies, psychology and environmental engineering.

Grunert *et al.* (2014) found sustainability labels don't significantly impact food choices. Leach *et al.* (2016) highlighted the need to understand consumer use of environmental impact labels, suggesting varying suitability across sectors. Prieto-Sandoval *et al.* (2016) noted a gap in understanding eco-labels' influence on technological development. Asioli *et al.* (2020) stressed the importance of understanding consumer values and enhancing eco-label comprehension. Narciso and Fonte (2021) advocated policy reforms for inclusive decision-making in promoting healthy diets. Potter *et al.* (2021) supported eco-labels' role but called for more research on their attributes. Riskos *et al.* (2021) emphasised the credibility of eco-labels in influencing green purchase behaviour. Lastly, Stein and de Lima (2022) endorsed comprehensive mandatory labelling for sustainability, encompassing multiple dimensions and evidence-based criteria.

Eco-labelling predominantly influences markets, but wider environmental goals rely on economic actors transitioning to sustainable business models. Managers and organisations drive eco-label decisions and sustainability initiatives. Dórea *et al.* (2022) highlighted market-driven articles on eco-labelling dimensions. Hence, focussing on business and management journals in our review seems crucial to shaping research agendas in this domain.

Three literature reviews on eco-labels in business and management journals – Dórea *et al.* (2022), Manta *et al.* (2023) and Maesano *et al.* (2019) – were identified in the WoS database. Dórea *et al.* (2022) conducted a broad analysis of environmental labelling across various products. Manta *et al.* (2023) examined eco-labelling certification approaches across different sectors, including tourism. Maesano *et al.* (2019) focused solely on wine-related purchasing behaviour within the specified timeframe of 2003–2018.

Dórea *et al.* (2022) highlighted the prevalence of eco-label studies within the food industry, especially regarding fish, rice and coffee, emphasising the sector's significance in eco-labelling due to its engagement with consumers, suppliers and the government. They noted a growing interest in sustainability after 2010, particularly in food, agriculture and seafood.

Maesano *et al.* (2019) noted a research focus on the environmental aspect of sustainability and identified gaps in understanding contextual impacts on consumer behaviour and persistent confusion surrounding sustainability concepts. Manta *et al.* (2023) emphasised territorial development and stakeholders' perceptions of labelling, highlighting the need to understand factors influencing label design and development.

3. Research methodology

This study utilises a hybrid review approach combining bibliometric analysis and a framework-based review, as proposed by Paul and Rosado-Serrano (2019) and Nicolas and Geldres-Weiss (2023). Employing the TCCM approach (Paul and Rosado-Serrano, 2019), this systematic analysis explores food eco-label literature in business and management domains.

Aligned with Paul and Rosado-Serrano (2019), our goal was to enhance comprehension of sustainability labels in the food and beverage sectors within business and management studies. Identifying key gaps in existing literature, we aimed to guide future research directions.

Although other databases like Scopus and Google Scholar exist, our study focused on WoS due to its renowned journal quality and analytical systems. WoS is recognised as a reliable global citation database for publishers (Valenzuela *et al.*, 2018) and is widely trusted in academic and scientific research worldwide (Clarivate, 2023).

3.1 Data collection and processing

The WoS database was used to identify all its published studies on food eco-label research between 2002 and 2022. The search query was built as a keyword search: ecolabel* AND food AND business, OR ecolabel* AND food AND management, OR eco-label* AND food AND business, OR eco-label* AND food AND management, OR "sustainab* label*" AND food AND business, OR "sustainab* label*" AND food AND management, OR "Eco-friendly label*" AND food AND business, OR "Eco-friendly label*" AND food AND management, OR "environmental label" AND food AND business; OR "environmental label" AND food AND management.

Subsequently, the only documents of interest were articles, review articles, letters and notes (Merigó *et al.*, 2015). Then, the final search criteria were filtered and redefined by selecting the criteria subject area set to "business" and "management", type of source set to "journal", and language "English" – in order to retrieve all relevant significant studies from all the available journals in the area of business and management research. A total of 79 documents were identified (Figure A1). The search was performed on 7 December 2022.

To ensure study relevance and quality, specific inclusion and exclusion criteria were set. Following protocols from prior systematic reviews in management (Martínez-López *et al.*, 2018), our search focused on peer-reviewed academic publications in the WoS scientific database, known for its top-tier business and management journals. Papers not aligning with business and management analysis were excluded, resulting in the removal of 25 papers. Additionally, 19 duplicates from the keyword search and three bibliometric reviews were also excluded. Refer to Figure A1 for the article selection process.

Out of the initially identified 60 papers, 25 were discarded after review for misalignment with our research focus. These excluded papers covered diverse topics such as eco-labelling organisations, organic markets, non-food products, carbon calculators, sustainable funds, seed licences and studies lacking label analysis, resulting in 35 papers remaining. Among these, three were literature reviews, leaving 32 papers for bibliometric analysis (see Figure A1). It's important to note that the exclusion of studies unrelated to food may limit the breadth of insights in eco-labelling beyond the food sector.

3.2 Study design

3.2.1 Bibliometric analysis. Following the research questions outlined in the Introduction, the study's structure was guided accordingly. To address RQ1, a bibliometric analysis was conducted, drawing from methodologies outlined by Valenzuela-Fernandez *et al.* (2019). This analysis, performed using VOSviewer software, aimed to uncover trends, citation patterns and influential aspects within the research field through keyword co-occurrence analysis.

A ranking was established based on several indicators, with the H-index as the primary criterion. The H-index, known for its simplicity and balance between publication volume and influence, signifies that a minimum of “x” articles have received at least “x” citations. This metric combines publication output and citation impact, focussing on primary citations and offering equal weight to both publications and citations (Valenzuela-Fernandez *et al.*, 2019).

The bibliographic review covered the following aspects:

- (1) Annual scientific production: Reveals research trends and interest in the topic.
- (2) Most-cited journal: Identifies influential journals based on total papers, citations, average citations per paper and H-index.
- (3) Country citations: Identifies research productivity by country, considering total papers and citations.
- (4) Most-cited papers: Ranks the top ten influential papers, detailing their citations, authors and average citations per year.
- (5) Keyword co-occurrence analysis: Examines related topics within the study by analysing cited articles and establishing the topic's structure.

3.2.2 Theory–context–characteristics–methodology (TCCM). Addressing RQ2, we employed the TCCM analysis, previously used effectively in business research by Paul *et al.* (2021), Chen *et al.* (2021), Lim *et al.* (2021) and Mandler *et al.* (2021). This framework facilitated a comprehensive exploration of prevalent theories, constructs, methods and potential research directions within food eco-label studies, aiding in theory development, contextual understanding and methodological exploration for future research.

4. Results

4.1 Findings of bibliometric analysis

There's a notable upward trend in scientific interest and a significant surge in research on this topic, particularly evident from 2021. The publication of articles on this subject has seen a recent increase, averaging three articles per year over the past eight years (refer to Figure A2).

Based on the Journal Citation Report (JCR), the top five influential journals in the “Business” category of the social science citation index (SSCI) relate to our topic (refer to Table A.I). Each journal listed had a minimum of two publications for ranking, as per the WoS database.

Among journals publishing two or more articles on food eco-labelling, the top-ranking journals based on total publications are as follows: International Journal of Consumer Studies: 4 articles, 202 citations, Q2, JCR Category: Business in SSCI; Business Strategy and the Environment: 3 articles, 102 citations, Q1, JCR Category: Business in SSCI; Journal of Business Research: 3 articles, 60 citations, Q1, JCR Category: Business in SSCI and Journal of Retailing and Consumer Services: 3 articles, 12 citations, Q1, JCR Category: Business in SSCI (refer to Table A.I).

Regarding the total publications by country (see Table A.II) we consider the level of scientific effort in the respective countries or regions in relation to scientific publications and citations (Clarivate Analytics). These indicators tend to be closely associated with the gross domestic product (GDP) and other economic output measures. Clarivate Analytics accounts

for countries/regions based on the institutional associations represented in published articles, considering the affiliations of all authors.

We considered countries with a minimum of two WoS publications for analysis. The US, Denmark and the Netherlands emerged as the most influential based on citations, while the US, UK and Italy were frequently mentioned in published papers. Notably, Central America, South America and Africa lacked publications on this topic. From 2002 to 2022, 11 countries were mentioned in at least two papers, with the US leading with 13 papers and 682 citations. Strong interest in this research is evident in Nordic countries like Denmark, the Netherlands and, to a lesser extent, Norway. Europe and the EU show substantial involvement in this field (refer to Table A.III).

The most frequently cited paper, with 218 citations, is titled “Willingness to pay for organic products: Differences between virtue and vice foods,” published in the *International Journal of Research in Marketing* in 2021. Table AII displays the top ten most-cited articles.

We aimed to identify primary keywords used by authors in the reviewed papers. Figure A3 and Table AIII present the visual and analytical results of keyword co-occurrences. Keyword co-occurrence clustering was generated using VOSviewer software (Figure A3). Nodes’ sizes represent keyword frequency, while connecting lines indicate shared keywords. Thicker lines denote stronger co-occurrence relationships between keywords (see Table A.IV and Figure A3).

4.2 Findings of TCCM analysis

Theory development. Recent studies have incorporated several key theories: cue utilisation theory (Orlowski *et al.*, 2022), aiding understanding of consumer expectations for non-visible product attributes (Olson and Jacoby, 1972); the theory of planned behaviour (TPB) (Chen, 2020; Siraj *et al.*, 2022), comprising attitude, subjective norms and perceived behavioural control (Ajzen, 1991); and signalling theory (De Brabandere *et al.*, 2022; Sigurdsson *et al.*, 2022), addressing information asymmetry reduction in market exchanges (Karasek and Bryant, 2012) (refer to Table A.V).

Context. Although research predominantly targets food in general, specific studies have delved into distinct food items like chocolate chip cookies (Amos *et al.*, 2019), cereal bars (Ertz *et al.*, 2017), muesli cereals (De Brabandere *et al.*, 2022), yoghurt (Donato and Adigüzel, 2022) and various commodities including coffee, rice, milk, fruit, meat, seafood and wine. Some studies have explored multiple food products.

Regarding the eco-labels featured or evaluated, most studies discuss eco-labels in generic terms such as “sustainable label”, “eco-label”, “eco-friendly label”, “green label” or “environmental label”. However, two prominent eco-labels often studied are the “organic label” and “carbon label.” Geographic research primarily focuses on developed regions like the European Union, North America and Oceania.

We examined various antecedents, moderators and dependent variables in food eco-label research. Antecedents encompass consumer-related factors like attitudes toward sustainability labels, environmental and health concerns, preferences for eco-label products and knowledge about eco-labels (refer to Table A.VI). Labels and packaging were also significant factors influencing eco-label effectiveness, alongside information. Additional variables considered included healthy food, food safety, subjective norms and perceived behavioural control.

Some studies introduce moderating variables, notably environmental concerns, influencing consumers’ attitudes (De Brabandere *et al.*, 2022; De Canio *et al.*, 2021; Hornibrook *et al.*, 2015; Siraj *et al.*, 2022). Additionally, various studies examine different mediator variables, with one variable acting both as a mediator and a moderator, such as the intention to purchase labelled products (Thøgersen *et al.*, 2010; Siraj *et al.*, 2022).

The most frequently studied consequences reflecting the effectiveness of an eco-label in the food sector are related to the following components of the TPB: attitude, purchase intention and purchase behaviour. Purchase intention and behaviour were the main constructs studied (see Table A.VII).

4.2.1 Analytical methods. Of the 32 papers analysed, three were focused groups (Eldesouky *et al.*, 2020; Hornibrook *et al.*, 2015; Sirieix *et al.*, 2013), and one was a conceptual proposition (Acuaye *et al.*, 2015). The most widely used methodology is regression analysis, which includes mediation regression analysis, moderation regression analysis and Tobit/Logit models (see Table A.VIII).

4.3 Future research agenda

4.3.1 Theory research agenda. Amos *et al.* (2019) suggested exploring the health halo effect in eco-label perceptions for more realistic product evaluations. Chen (2020) highlighted the importance of comparative studies in sustainable food consumption for deeper theoretical and managerial insights. D'Souza *et al.* (2021) underscored their contribution to consumer decision-making dynamics regarding eco-labels, offering groundwork for future studies on consumer self-confidence and green purchasing intent.

De Magistris *et al.* (2015) urged theoretical insights for stronger findings in their study on willingness to pay for canned tuna with corporate social responsibility (CSR) labelling. Van Doom and Verhoef (2011) echoed this need for more detailed studies with solid theoretical foundations. Zepeda *et al.* (2013) suggested a label consumer interaction framework for future research on consumer label choices.

4.3.2 Context research agenda. Recommendations emphasise the necessity for more research on diverse types or categories of labels, extending studies to different food and beverage products for comparative evaluations. Further exploration in various regional or cultural contexts and demographic differences is suggested. Addressing the growing array of eco-labels, future studies are urged to compare and study different types comprehensively. The global COVID-19 pandemic heightened environmental concerns, impacting perceptions and behaviours linked to eco-labelling, prompting the need for awareness in future research (Chen *et al.*, 2023; De Canio *et al.*, 2021).

4.3.3 Characteristics research agenda. Studies advocate exploring interactions between research variables like brand preferences and consumer behaviour, parental influence on purchase decisions, and the impact of manufacturers' policies and retailers' strategies. Additional areas include analysing attitudes, behavioural dispositions and aspects like scepticism, legitimacy, trust and confusion linked to eco-labels and certifying agencies.

4.3.4 Method research agenda. Studies have varied, with exploratory or experimental approaches aimed at understanding eco-labelling phenomena. There's a need for real-world validation of established assumptions and findings. Additionally, there are calls for diverse experimental, laboratory approaches, research instruments and analytical techniques.

5. Discussion

Our bibliometric analysis aligned with certain observations from prior reviews that overlapped with our focus. The growing motivation to research this topic resonates with trends found in studies by Dórea *et al.* (2022), Maesano *et al.* (2019), and Manta *et al.* (2023).

In analysing scientific output by country, our review mirrored findings from Dórea *et al.* (2022) regarding the prevalence of publications from the US and Europe in eco-labelling. In our focused study on food eco-labelling, the primary countries of research were the US, Italy and the UK. This echoes Maesano *et al.*'s (2019) observation of extensive research in Italy (given its focus on wine) and predominantly in European countries and the US.

Based on our TCCM analysis, this study delineated the consumer-related antecedents, frequently studied consequences and moderator/mediator variables in food eco-label research spanning 2 decades. To our knowledge, this comprehensive investigation represents the first of its kind in this domain.

Our findings align with eco-labelling dimensions impacting consumer willingness to pay for environmentally conscious products (Dórea *et al.*, 2022). They underscore the TPB model's components – attitude, perception, purchase intention and behaviour – influencing eco-label effectiveness in the food sector. Our study sheds light on consumer purchase behaviour in the food context (Maesano *et al.*, 2019), emphasising the necessity for real-world research on labelled food purchase behaviour. Moreover, our findings echo concerns about sustainability comprehension and consumer confusion (Maesano *et al.*, 2019), prompting further exploration into consumer knowledge, understanding and clarity regarding food eco-labels. This study also prompts inquiry into how information on food eco-labels is effectively communicated and disclosed to consumers.

Based on our comprehensive literature review, numerous recommendations emerge for future research in this expansive field. The primary emphasis revolves around establishing more robust theoretical frameworks to comprehend the evolving dynamics. Additionally, the predominant suggestions advocate expanding research contextually, either through comparative studies or by exploring a wider array of food categories and diverse eco-label types.

5.1 Theoretical implications

While Dórea *et al.* (2022) highlighted an upsurge in theoretical applications of environmental labelling, our examination of food eco-labelling in the business and management domain unveils openings for advancing, broadening and scrutinising theories. These encompass areas such as consumer behaviour, information and knowledge, environmental concerns, trust, packaging and willingness-to-pay in eco-labelling domains.

Previous studies underscored the nuances of consumer behaviour, emphasising the necessity to appraise diverse eco-label attributes in real-life scenarios (Potter *et al.*, 2021). Understanding how consumers engage with footprint eco-labels (Leach *et al.*, 2016; Asioli *et al.*, 2020) and assessing context's impact on consumer behaviour (Maesano *et al.*, 2019) remains paramount. Future investigations should extend the TPB (Chen, 2020; Siraj *et al.*, 2022) to probe the effectiveness of various eco-label attributes in practical contexts.

Similarly, our findings on information align with Maesano *et al.* (2019), highlighting its sway on consumer behaviour. Therefore, scholars could leverage the signalling theory (De Brabandere *et al.*, 2022; Sigurdsson *et al.*, 2022) to explore how information about food eco-labels is conveyed to and absorbed by consumers.

Expanding on the knowledge aspect, Asioli *et al.* (2020) emphasised understanding consumers' comprehension levels of eco-labels. Our research echoes concerns about consumer confusion regarding food eco-labels, aligned with Manta *et al.* (2023) and Maesano *et al.*'s (2019) findings in business and management journals. Given these insights, future studies could leverage an extension of the cue utilisation theory. This theory explains how individuals gather and process information from their environment to make decisions or perform tasks. Utilising this framework can shed light on how the extent of consumers' knowledge, understanding and confusion regarding eco-labels influences their behaviour.

Certainly, our findings align with Maesano *et al.*'s (2019) conclusions about the influence of values and beliefs on consumers' attitudes toward sustainable food purchases. Grunert *et al.* (2014) also proposed this as a focal area for future research, highlighting that the usage of labels depends on consumers' overall sustainability concerns. To delve deeper, scholars could employ the attribution theory, which delves into how individuals perceive and explain the

reasons behind events or behaviours, especially in assigning credit or blame. This theory holds promise in understanding people's perceptions and explanations regarding sustainability issues.

Trust in the context of food eco-labels, as noted by Moon *et al.*'s (2017), and the significance of packaging, highlighted by De Brabandere *et al.* (2022), Ischen *et al.* (2022) and Orlowski *et al.* (2022), are intriguing areas. Scholars might find the information overload theory beneficial in assessing trust's impact on consumer decision-making, focussing on the challenges posed by excessive information availability in the digital era, as proposed by Moon *et al.* (2017). Additionally, the application of the signalling theory could offer insights into how brands utilise verbal and visual cues in their packaging to communicate their dedication to sustainability.

Finally, the willingness-to-pay aspect resonates with Maesano *et al.*'s (2019) and Dórea *et al.*'s (2022) findings, as well as Eldesouky *et al.*'s (2020) conclusions regarding positive consumer attitudes toward sustainability but limitations in actual purchasing behaviour. Utilising the TPB, as advocated by Chen (2020) and Siraj *et al.* (2022), could offer valuable insights into understanding consumers' willingness-to-pay for eco-labelled food products.

5.2 Managerial implications

This study pinpoints crucial topics vital for stakeholders in the food industry, notably focussing on eco-label information. Addressing consumer confusion, echoed in existing literature (Moon *et al.*, 2017; Maesano *et al.*, 2019), emphasises the necessity for enhanced efforts by companies, educational institutions and governments to disseminate accurate and understandable knowledge about eco-labels. Additionally, the escalating number of diverse food eco-labels at both national and global levels underscores the urgency for standardisation and harmonisation efforts. The EU's pioneering regulatory policy acts as a frontrunner, propelling international strides toward uniform front-of-pack food eco-labelling. This proactive pan-European strategy, spearheaded by certification standards (European Commission, 2020), is projected to potentially become mandatory in the future, curtailing the influx of new labels entering the market (European Commission, 2023).

5.3 Social implications

The knowledge derived from this research holds significant potential in shaping policies and devising tools aimed at reducing the carbon footprint linked to food production and consumption. Considering the substantial impact of these activities on our planet's carbon footprint, addressing food security and sustainability emerges as a crucial concern for humanity. Recognising the importance of eco-label communication and information becomes particularly pertinent for future generations, who stand to bear the most substantial impact of climate change and sustainable development. These generations are also more inclined toward embracing and implementing sustainable practices. Hence, any initiatives focused on effectively educating and empowering these future generations become integral in realising universal sustainable development goals.

6. Conclusions

Eco-labels in the context of food products have gained significant attention in the research domains of business and management. These labels serve as a way for consumers to make informed choices about the environmental and ethical impact of the products they purchase. Research in this area often explores the effects of eco-labels on consumer behaviour, supply chain management, and the business strategies of food companies. This study sought to critically review studies on food eco-labels published in the research domains of business and

management, identify the research gaps, and consolidate and propose a future research agenda. The first research question was: (1) What is the structure of research on food eco-labels in the business and management research domains? Building on our findings from that analysis and extending our research deeper, our second research question was: (2) What are the research gaps in the existing literature and what are avenues for future research in the field of food eco-labels in these domains?

In examining the structure of research in the business and management research domains, a noteworthy trend emerges concerning food eco-labels. There is a clear and progressive increase in scientific motivation to explore this topic, with a significant increase in this trend starting in 2021, which confirms its validity and the need for further research in the area of business and management. A lack of research in the Southern Hemisphere is evident, presenting the need to generate greater knowledge from countries on this side of the hemisphere and corroborate any similar results.

The research gaps in the existing literature present avenues for future research in the field of food eco-labels in the business and management research domains. An important consideration is for future research to contend with cross-country research and different cultural contexts or demographics, as most existing studies have been single-country studies. Nevertheless, country and cultural aspects impact many characteristics associated with perception, consumption, affluence and other facets associated with environmentalism, including eco-labelling (Johnson *et al.*, 2001). Country and cultural aspects shape how people perceive and respond to environmental challenges, influencing consumption choices, the affluence-environmental impact relationship, the effectiveness of eco-labelling and the development of environmental policies. Understanding these cultural and national influences is crucial for designing effective environmental strategies and initiatives that are relevant to the local context.

Other recommendations for future research, as expected, include various research characteristic proposals concerning variables and their associations used in the analyses, as well as methodological and sampling suggestions. Given the universal trends and dynamics associated with mounting policy pressures and sustainability regulations, and heightened environmental sensitivity, we believe that some key areas deserve particular attention to provide further insights into this evolving field of research. This domain will continue to garner increasing attention in the future. The proposed future research avenues are summarised in Table 1.

However, our study has limitations. First, despite the well-established and appropriate standing of this study, we limited the sample of articles to those featured in the WoS database.

Topic	Research question
Consumer behaviour	What are consumers' real purchase behaviours for eco-labelled foods in real contexts?
Information	How is information about food eco-labels communicated and disclosed to consumers?
Knowledge	What is the extent of knowledge, understanding as well as level of confusion of consumers in relation to food eco-labels?
Environmental concern	What are consumers' environmental concerns and values in relation to eco-labelled foods? Does this vary by generation, country or culture?
Trust	What are consumers' trust levels on eco-labelled foods? Does this vary by generation, country or culture?
Packaging	What is the attributed importance of verbal and visual sustainable cues in food packaging?
Willingness-to-pay	Under what conditions are consumers willing to pay extra for food with an eco-label?

Source(s): Authors' elaboration

Table 1.
Future research
avenues

Other databases, such as Scopus, should be included in future research. Second, we focused on research published only in the business and management domains. Future research could include other areas beyond such specialised outlets, as food topics extend beyond this research area. Third, our search and concomitant analysis were based on a group of keywords related to ecological labels. However, some potentially relevant keywords might have been overlooked. Fourth, some research papers were intentionally omitted from the analysis, such as those on eco-labelling organisations (Boström, 2006; Couckuyt and Van Looy, 2021).

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Appendices

The supplementary material for this article can be found online.

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Exploring flexible working practices and the digital divide in a post-lockdown era

FWPs and the digital divide in post-lockdown

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Abstract

Purpose – This paper explores flexible working practices (FWPs) and takes a critical view that argues a need to consider not only access to digital technological resources but also the vast array of factors that constrain one's ability to use technology for its intended benefits, as constituting the digital divide post-COVID-19 lockdown.

Design/methodology/approach – Using a critical evaluation of the extant literature, we engage in a conceptual undertaking to develop theoretical propositions that form the basis for future empirical undertakings. To theoretically ground the arguments raised, we deploy the ontological lens of actor-network theory to illuminate the socio-technical dimensions of the digital divide in light of FWPs.

Findings – Since the COVID-19 pandemic, the need to adopt socially distanced work practices has become a reality for many organisations. We find that the adoption of FWPs, enabled by digital technologies, simultaneously signals hidden inequalities. We also develop a conceptual framework which depicts user responses in different technology environments that can either be limiting or enabling for individuals' work productivity.

Originality/value – With regards to the digital divide, attention has often focused on access to digital technologies, as the term "digital divide" portrays. The implication is that the array of factors and resources that individuals are heterogeneously networked to, which also constitute the digital divide, is often taken for granted. We take a different ontological view that brings to the fore other factors at play within an individual's network of relations.

Keywords Flexible working, Remote work, Digital divide, Lockdown, COVID-19, Technology environment

Paper type Conceptual paper

1. Introduction

Flexible working practice (FWP) connotes a way of working that is unimpeded by fixed time schedules, spatial boundaries and contractual limitations (Groen *et al.*, 2018; Soga *et al.*, 2022). It has been studied in various ways including its relationships with organisational attraction (Yu *et al.*, 2019), organisational outcomes (Maruyama and Tietze, 2012), the strategic motives of employers (Alward and Phelps, 2019; Raghuram, 2014), relationships with national cultural values (Vallicelli, 2018) and social perceptions (Groen *et al.*, 2018) among others. In recent years, especially as a result of the COVID-19 pandemic and its social distancing imperatives, FWP has gained even more attention in scholarly literature as its

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implementation gained traction in contemporary organisations (Chadee *et al.*, 2021; Furmańczyk and Kaźmierczyk, 2020). This is coupled with the fact that there is a notable rise in the adoption of digital technologies that support FWP, with research estimating a \$50.7 billion industry by 2025 (Kurtzman, 2021).

However, this increased focus on digital technology adoption for FWP has inadvertently masked a dark side: that is, the digital divide, which describes the infrastructural and technological gaps observed across the globe where some geopolitical zones are associated with greater technological access than others (Chen and Wellman, 2004). Recent research on the impact of remote working on employees signals that this digital divide is masked within organisations (Kuc-Czarnecka, 2020). There is therefore a need to expand its understanding in terms of intra-organisational infrastructural gaps which predispose some employees to greater productivity than others. Such inequalities potentially affect the ability of both workers and organisations to address inherent productivity challenges.

The challenges facing remote working arrangements are largely associated with the deployment of digital technologies (Solís, 2017), and authors argue various pitfalls including social isolation (Mulki and Jaramillo, 2011), exclusion (Soga *et al.*, 2020), lack of team cohesion (van der Lippe and Lippenyi, 2020), blurring of work and family life (Como *et al.*, 2020) and other unintended consequences referred to as “the other face” of FWP (Soga *et al.*, 2022). However, we observe a dearth of studies that draw attention to the inequalities posed by the digital divide as organisations widely adopt digital technologies for FWP, especially during and after the COVID-19 pandemic (Furmańczyk and Kaźmierczyk, 2020). Government-enforced lockdowns and other social distancing measures underpinned this shift to remote working and the consequent increase in the use of collaborative technologies.

Evidently, ubiquitous digital technologies for organisational practices make the shift to flexible working arrangements necessary (Hirsch-Kreinsen, 2016), but growth in the market for communication and collaboration technologies by nearly 25% in 2020 alone (International Data Corporation, 2021) also deepens the digital divide. The amplification of the benefits of FWP for the modern workforce unintentionally silences the challenges of those on the disadvantaged side of the digital divide (Dwivedi *et al.*, 2016; Ashman *et al.*, 2022). The resultant effect is that the challenges posed for FWP as a result of the digital divide during and post-COVID-19 lockdown era remain hidden and undertheorised. This is particularly the case when it comes to individual responses to the downsides of FWP, a gap in the literature we seek to address in this paper. We therefore take a critical view of the implications of FWP for the digital divide and vice versa, during and after the COVID-19 lockdown era.

Our inquiry is driven by the following research question:

RQ1. What are individual-level responses to FWP in the context of the digital divide during the COVID-19 post-lockdown era?

As our contribution, we propose a model that argues various response mechanisms by individuals that are affected by the digital divide. We consider factors that interact with the use of available technologies as also contributing to the digital divide. Additionally, with research on the impact of the COVID-19 pandemic still at its nascent stage, we deploy our understanding of the studies published during this period to develop propositions that contribute to ongoing debates in the field regarding FWP and the digital divide, and also open up areas for future research. We begin by exploring the concept of FWP in the COVID-19 lockdown era to lay out the broader field with respect to the digital divide. To ground our arguments within a theoretical framework, we draw on the philosophical assertions of actor-network theory (ANT), which embraces the agency of technological artefacts in human sociality. We then discuss the digital divide within the context of FWP in a post-lockdown era while raising theoretical and practical implications. We discuss the implications these hold for working flexibly in the digital divide and raise propositions that open up avenues for future research.

2. FWP in the COVID-19 lockdown era

FWPs occur in various forms in the literature with terms such as remote work, virtual work, telework, on-demand work, on-call work, flexiwork and freelancing used to describe this working model (Marica, 2019; Tudy, 2021). Although these terminologies carry nuances in how FWP is conceptualised, the common denominator is the idea that these working arrangements do not rely on fixed employer contractual documents that spell out work patterns (Choi, 2018). Another commonality is the dimension of spatial and time flexibility FWP affords for which several benefits are argued. For example, parents working remotely are more able to attend to childcare needs (Genadek and Hill, 2017), work travel times are reduced (Hopkins and McKay, 2019), organisations are able to save on energy and other utility bills as a result of fewer use of the office space (Richardson and McKenna, 2014) and more radically redundant office space is available to be repurposed for other uses *inter alia*.

However, the mandatory lockdown period necessitated by the COVID-19 pandemic exposed hidden pitfalls as most organisations adopted the practice (Matli, 2020; Adisa *et al.*, 2022). For example, Como *et al.* (2020) show that 38% of jobs in Canada that were before done onsite could now be done remotely, with similar statistics reported for the United States. With office spaces closed and workers now having to depend on digital technologies and associated technological devices for work, studies show that imbalanced home/work functions and technological dependence emerge as potential pitfalls for workers (Genadek and Hill, 2017; Pascucci *et al.*, 2022). Job demands, coupled with the stresses of the pandemic, have resulted in family conflicts, particularly for working parents (Bolade-Ogunfodun *et al.*, 2022). These family pressures were shown to be pronounced for those who needed to offer support for their children who were also now fully learning from home (Kuc-Czarnecka, 2020). Additionally, a working arrangement epitomised as “flexible” decreased the practice of flexibility in a context of mandatory implementation, since it co-occurred with the absence of practical and emotional support services, such as childcare or “face-to-face” social gatherings (Adisa *et al.*, 2022).

Additionally, FWP during the lockdown era seemed to have downsides of a gendered nature, with women bearing the brunt. This is because of the “traditional” gender roles and expectations which place additional pressures on female employees (Bolade-Ogunfodun *et al.*, 2022). Achieving a “work-life balance” appears to be an impossible task for women as the combination of home commitments and remote work pressures often leads to burnout, anxiety and other health challenges (Peasley *et al.*, 2020). These harmful effects relate to the blurring of work time and home time as extra work efforts spill into domestic activities. The gendered nature of these effects is also observed in situations where working mothers receive wage penalties or unfavourable evaluations about their commitment to work where they are unable to put in extra hours into their day jobs (Collins *et al.*, 2021).

Empirical studies that explore FWP in the COVID-19 era also identify some gendered issues including patriarchal cultures at the workplace affecting female teleworkers (Gálvez *et al.*, 2021), employee health challenges (Johnson *et al.*, 2020) and managerial issues such as remote leadership tensions with employees (Toleikienė *et al.*, 2020). We offer a summary of these key issues in the COVID-19 pre-/post-lockdown period in Table 1 based on the relevance of their empirical findings that speak to the arguments raised in this paper.

Furthermore, FWPs during the lockdown period showed the importance of the often taken-for-granted digital technologies that workers deploy for their daily tasks, but also revealed a dark side of organisational digitisation (Trittin-Ulbrich *et al.*, 2021) and technological dependence (San-Martin and Jiménez, 2023). In this regard, studies conducted during the lockdown periods have not only examined how digital technologies impact remote work (see Toleikienė *et al.*, 2020), but also how this dependence on digital technology impacts worker health (Johnson *et al.*, 2020), worker dispersion (Ruiller *et al.*, 2019) and, more importantly, digital inequalities and deprivation (Kuc-Czarnecka, 2020).

Authors	Year	Paper title	Recognised issues	Location of study
Johnson A., Dey S., Nguyen H., Groth M., Joyce S., Tan L., Glozier N., Harvey S.B.	2020	A review and agenda for examining how technology- driven changes at work will impact workplace mental health and employee well- being	Mental health affected by technology use	Australia
Bhumika B	2020	Challenges for work–life balance during COVID-19 induced nationwide lockdown: exploring gender difference in emotional exhaustion in the Indian setting	Gender differences in emotional exhaustion	India
Elfering, A; Igic, I; Kritzer, R; Semmer, NK	2020	Commuting as a work-related demand: Effects on work-to- family conflict, affective commitment, and intention to quit	Temporospatial pressures	Switzerland
Kuc-Czarnecka, M	2020	COVID-19 and digital deprivation in Poland	E-exclusion; digital inequalities	Poland
Toleikiene, R; Rybnikova, I; Jukneviene, V	2020	Whether and how does the Crisis-Induced Situation Change e-Leadership in The Public Sector? Evidence From Lithuanian Public Administration	E-leadership and tensions with employees	Lithuania
Bohman, H; Ryan, J; Stjernborg, V; Nilsson, D	2021	A study of changes in everyday mobility during the Covid-19 pandemic: As perceived by people living in Malmo, Sweden	Changes in mobility	Sweden
Galvez, A; Tirado, F; Alcaraz, JM	2021	Resisting Patriarchal Cultures: The Case of Female Spanish Home-Based Teleworkers	Resistance by female teleworkers	Spain
Tudy, RA	2021	From the corporate world to freelancing: the phenomenon of working from home in the Philippines	Transformation of work into freelancing	Philippines
Mangla, N	2021	Working in a pandemic and post-pandemic period – Cultural intelligence is the key	Disrupted communication of virtual teams in post- COVID-19 period	US

Table 1.
Emerging research of
pre-/post-COVID-19
related issues

Source(s): Table by authors

This dominance of digital technology in the lives of workers during the lockdown raises concerns about technostress (Bennett *et al.*, 2021) but also that individuals risk unhealthy and detrimental attachments to technology (Chadee *et al.*, 2021; Rohwer *et al.*, 2022). At the organisational level, the concerns raised have largely been about the difficulty of managing workers across different geographic and time zones (Aroles *et al.*, 2022). At the individual level, there are also risks of exclusion, isolation, surveillance, self-censorship and, ultimately, unemployment due to lack of technological know-how and the digital divide (Soga *et al.*, 2021a, b), all of which, we argue, reflect an ontological reality.

2.1 Actor-network theoretical framing

The ANT challenges the concept of agency in sociology in ways that radically consider objects (including technological applications) as having the ability to act on humans (Latour, 2005; Law, 1992). To “act” in this sense is to act with or without intentionality. In fact, the definition of agency from an ANT perspective is “the ability to act and elicit a response either with inherent intentionality in the case of a human agent, or (un)programmed intentionality in the case of a designed artefact” (Soga *et al.*, 2020, p. 646). This ANT assertion has implications for what the nature of human sociality is. This is because it brings objects into the space of the social (Latour, 2005). In this sense, digital technologies that are deployed for work are considered as being able to act on those that use them. The underpinning ontological view is that technologies, texts, “things” and so forth are all constituents of the social and are part of a heterogeneous network of relations (Latour, 1992, 2005).

The idea of heterogeneity here is in reference to humans and non-humans, both of which must be treated equally (methodologically) in ANT’s principle of generalised symmetry (Callon, 1986); that is, the same descriptive or explanatory frameworks must be applied to both human and non-humans in the heterogeneous network. From that ANT perspective, FWPs are constitutive of the humans involved and the very digital technologies they deploy. The two entities are relationally connected in ways that give them their ontological status, such that there is no FWP without the technologies used to make it a practice (Yu *et al.*, 2019). These ANT-inspired assertions colour our lens as we develop propositions in this paper. The insights help us explore what is often taken for granted, which in this paper, we argue, are the hidden aspects of the digital divide in relation to FWP.

3. Developing conceptual propositions

We engage in a conceptual undertaking that develops theoretical propositions based on an in-depth and critical review of the extant literature. This followed our systematic literature review (see Soga *et al.*, 2022) published in *Journal of Business Research*. We choose this approach to further deepen our insights from the systematic review whose aim was to organise the literature. Whereas our systematic review uncovered insights on the downsides of FWP, it was limited in its scope with respect to the digital divide. Additionally, its general outlook meant that the “micro-level” individual responses to the downsides of FWP in relation to their technology environments could not be more deeply explored. This conceptual undertaking was thus warranted to respond to the obvious gaps we identified. This is particularly necessary as the COVID-19 pandemic precipitated various conditions that affected individuals’ technology-mediated work practices. We do so through a critical evaluation of the digital divide and FWP. This led to the raising of propositions in the literature, which simultaneously present avenues for future empirical undertaking. Thereafter, we explore user responses to technology due to (arguably, in spite of) the digital divide, a contribution that also supports our arguments towards the effects of the digital divide on various forms of FWP.

3.1 The digital divide and FWP

The concept of the digital divide has often been considered as a symptom of the gap between the Global North and the Global South. There is strong evidence for this view, as satellite imagery of global Internet penetration shows some parts of the world as well-lit (that is the Global North) and others as poorly lit or completely dark (representing the Global South). Although the digital divide is traditionally understood to refer to (non-)access to technological devices and their corresponding applications, research findings indicate the need for a broader conceptualisation that includes the array of resources that either enable or prevent

individuals from using digital technology (Warschauer, 2004; Lythreathis *et al.*, 2022). In other words, the literature's narrow conceptualisation of the digital divide fails to recognise the myriad of enabling factors such as the technological know-how, spatial requirements, time and the flexibility needed especially for those in flexible working arrangements. Accordingly, the concept of the digital divide goes beyond issues of "access" alone that has plagued the Global South (Chen and Wellman, 2004).

At the organisational level, the arguments of "access" to technology do not seem to hold as workers are given the relevant technological resources to do their jobs, although these also come with privacy concerns (Bhave *et al.*, 2019). However, a hidden danger lurks intra-organisationally, as the availability of technological devices for employees masks the digital divide *within* the organisation. The COVID-19 pandemic represents a context which reveals, we argue, the hidden inequalities in the digital divide. The shift to working from home necessitates the need for employers to provide work tools and equipment as well as updated software subscriptions and cybersecurity protection for workers. However, it is silent on the fact that employees are consequently saddled with direct responsibility for providing ongoing Internet connectivity to sustain long hours of working. Differences in employee capabilities with respect to providing such critical connectivity implies that we can expect variations in worker productivity (Pontones-Rosa *et al.*, 2021). As employees were geographically scattered as a result of the work-from-home mandate that the pandemic necessitated, the availability of technological devices to employees did not necessarily equate to technological access that ensured worker productivity. We argue that the array of other resources that are, in ANT terms, heterogeneously networked with the worker should also be given consideration so as to close the gap.

The global digital divide is thus considered to also include three aspects: geographic, socioeconomic and user-related factors (Chen and Wellman, 2004). The geographic digital divide describes the consideration given to within-country locations where access to the Internet and other technological devices are limited in comparison to other locations. The socioeconomic digital divide speaks to issues regarding income inequalities which create limitations or advantages for certain groups over others in relation to having access to the Internet and associated technologies. User-related factors have to do with a consideration of the technological know-how or literacy that enables one group of people to have access, while others are left out (Chen and Wellman, 2004). These arguments challenge the conventional understanding of the digital divide in the literature and underpin our call for broadening the typical location-specific conceptualisation. We argue that the idea of the digital divide occurs not only across the Global North-Global South dichotomy, but also within each context (Rico and Cabrer-Borrás, 2019). For FWP during the COVID-19 lockdown era, individuals were thus susceptible to the digital divide, being geographically dispersed and left to cater to their digital connectivity needs (Barsness *et al.*, 2005). In other words, workers who possess all the needed resources for effective remote work are those who are privileged, while others may be unable to do so despite having company-owned equipment or work tools, for example laptops. We therefore propose the following:

Proposition 1. The successful adoption of FWP in organisations is determined by the extent to which the digital divide at the level of individuals is resolved.

3.2 User responses to digital technology due to the digital divide

In the context of remote working and the digital divide, an analysis of work contexts would include not only technology and its affordances but also resources that facilitate or impede productivity as well as user responses. Responses by individuals to technological deployments take various forms along several lines and are driven by a number of factors (Choudrie and Zamani, 2016). Favourable responses manifest in early adoption of

technologies and their application to work, which results in productivity, while other user responses include resistance to new work processes and platforms (Beaudry and Pinsonneault, 2005; Burchell, 2011), technological dependence (Matli, 2020), isolation from work colleagues (Mulki and Jaramillo, 2011), exclusion from work activities and self-censorship (Soga *et al.*, 2021a, b) among others.

From an ANT perspective, responses to digital technologies are as much about what the technology allows as it is about other factors or conditions which contribute to ensuring that the work is done (Beaudry and Pinsonneault, 2005; Sun, 2012). Given our conceptualisation of the digital divide as also being about the array of conditions necessary to work effectively in the digital space, employees facing difficulties with connectivity or lacking in technological know-how face a different set of challenges that require particular responses to technology in order to get work done (Shakina *et al.*, 2021). Olson and Olson (2000) show how individuals are able to adapt to weak technology environments through behaviour modifications as they engage with technology. For example, in the case of telephone conferences, an individual who is committed to his/her collaborative task may sit for an hour on a weekly basis, shouting through meetings as a response to the low volume of the voices from other participants on the other end (see Olson and Olson, 2000, p. 154). The assumption is that different technology environments elicit particular responses from users so that expected outcomes are achieved (Sun, 2012).

By “technology environment”, we mean the totality of technological infrastructure including the social factors that enable an individual to do their job or which constrain an individual from (effectively) doing their job since they are in a heterogeneous network. Consequently, we conceptualise technology environments as either *enabling* or *limiting*. An *enabling* technology environment is one in which the technological infrastructure and the social factors surrounding the use of technology allow the user to realise the benefits for which the technology was deployed. In this light, studies identify differences in technological environments at individual, organisational and country levels which affect access to and ability to adopt deployed technologies for work (Riggins and Dewan, 2005). These include user access, user knowledge gaps, organisation size, digitisation capacity, ownership status, industry or country location, socioeconomic factors or infrastructure, technological context and so forth (Pillai *et al.*, 2022). In other words, an enabling technology environment is one that is fit for purpose, and which allows the individual to get their job done irrespective of a “lockdown” scenario. Conversely, a *limiting* technology environment refers to one in which the technological infrastructure and the social factors surrounding the use of technology constrain the user in ways that inhibit the delivery of the benefits for which the technology was deployed. It is a technology environment that is present but not fit for purpose. Examples may include low Internet bandwidth preventing smooth video online communication, limited RAM of a laptop preventing the use of resource-hungry software and spatial limitations preventing a work-from-home parent from participating in an online meeting among other things.

Whereas some individuals may operate in adequately resourced technology environments that allow them to effectively work remotely, others across the digital divide potentially face situations in which they work around the limitations of their technology environments or are cut off altogether (Riggins and Dewan, 2005). In the case of the former, the individual is highly motivated to find a solution to challenges faced, while in that of the latter, the individual is either not motivated or is limited by conditions outside their control due to the weaknesses of the technology environment (Beaudry and Pinsonneault, 2005). In ANT terms, various non-human conditions are acting upon the individual. In other words, the technology environment is exercising agency to which the individual either has a strong or a weak response. We thus propose the following:

Proposition 2. User response to digital technology environments in FWP is determined by the nature of the technology environment (limiting or enabling).

We argue that in FWP, user responses to digital technology environments may produce four levels of engagement with work (summarised in Figure 1). Whereas some individuals might make some behavioural adjustments due to their technology environments (Olson and Olson, 2000; Soga *et al.*, 2021a, b), we argue that others may either be disengaged or be limited in their level of engagement or commitment to the task (Soga *et al.*, 2020). First, we conceptualise behavioural adjustments where individuals have a strong response to limiting technology environments as adaptive engagement. In other words, we propound that individuals demonstrating strong response are those that adapt to the constraining factors or work around those factors to achieve their work goals. The second level of engagement is shown in the converse where individuals make no behavioural adjustments or are simply unable to do so due to factors beyond their control. We categorise this as a weak response to the limiting technology environment where the individual is altogether disengaged from the job. In the third level of engagement, we do not assume that an enabling technology environment automatically produces strong individual responses or delivers effective work outcomes. Instead, limited engagement may occur even in cases where the technology environment is an

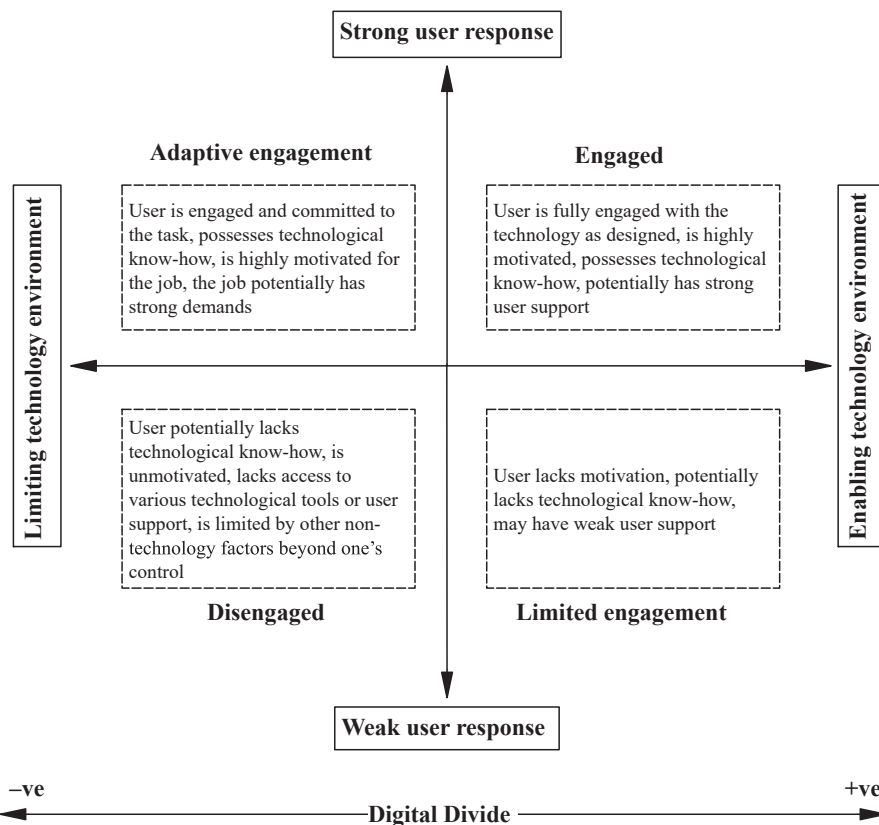


Figure 1.
User responses to
digital technology
environments in FWP

Source(s): Figure by authors

enabling one, but the individual displays a weak response due to lack of motivation for the task. The fourth level of engagement is the instance in which a highly motivated individual has an enabling technology environment and delivers a strong response. By these four levels of engagement, we do not mean an upward or increasing level of engagement so that one is higher or better than the other. Instead, we offer a starting point in arguing the various ways in which individuals might respond to their technology environments in light of the digital divide. For further clarity, we offer these arguments in a 2x2 matrix shown in Figure 1, and then explore the implications in light of digital divide for various forms of flexible working that users are often involved in.

3.3 Effects of the digital divide on various forms of FWP

The literature offers different conceptualisations of FWP, and the terms used to describe it are often employed interchangeably (Jacobs and Padavic, 2015; Tudy, 2021). These include remote work, on-call work (Marica, 2019), telecommute work (Aloulou *et al.*, 2023) and so on. What is common to all these approaches or conceptualisations of FWP is the idea of “flexibility” for the worker. However, these ideas do not take into consideration the digital divide and its impact on such “flexibility” that FWP affords. We now expand on the effects of the digital divide on different forms of flexible working, linking these to our conceptual propositions.

3.3.1 Working remotely and the digital divide. Working remotely assumes work that is conducted outside of the traditional office building without taking into account the time for which the work is done (Waples and Brock Baskin, 2021). Although this idea of working remotely highlights a form of flexibility (see Jacobs and Padavic, 2015) in which the worker is not bound by contractual time (usually Monday to Friday in Western countries), working remotely is challenged by the digital divide in ways that defeat the job’s “remote” nature. This is because work done “remotely” is often designed to be supported by digital technologies that allow continuous conversations surrounding the milieu of tasks to be done (Richter, 2020). In ANT terms, this speaks to the connectedness of the individual in a network of relations, which, in this instance, allows for both synchronous and asynchronous ways of communication during never-ending “office hours” (Chadee *et al.*, 2021).

To a large extent, organisations would often provide employees with digital technologies with organisation-level support or software subscriptions (Huang, 2022). With such “access” granted employees, it is often assumed that all users possess the technological know-how or an enabling technology environment to ensure adequate or full usage of the technology (Chadee *et al.*, 2021). The implication is that although digital technology for mandatory remote working during the COVID-19 lockdown offered an opportunity for work to continue outside the office space (Mansor and Ldris, 2015; Adisa *et al.*, 2022), issues surrounding the digital divide are drowned out and those who are disadvantaged are inadvertently silenced. Remote work is thus negatively impacted for individuals who are affected by the digital divide in ways that include family time conflicts (Como *et al.*, 2020), loss of social contact (Mulki and Jaramillo, 2011; Morrison *et al.*, 2023) and, ultimately, socioeconomic challenges due to inability to work (Rafnsdóttir and Heijstra, 2013; Atasoy *et al.*, 2021), that is, even though these individuals may have organisation-level support for their physical technological devices. We thus propose the following:

Proposition 3. Organisational provision of technological devices for remote work is more likely to hide the effects of limiting technology environments than when individuals work from the office.

3.3.2 On-call workers and the challenge of the digital divide. On-call work is one aspect of FWP that typifies unpredictability of work in which individuals are assigned job tasks for a

specified amount of time without the need for fixed term contracts (Marica, 2019). While on-call work is precarious as it is dependent on job availability from potential employers, workers have a degree of freedom to direct what jobs they take or avoid. The level of autonomy depends on whether workers are officially attached to an organisation (Laker *et al.*, 2023) or whether they are completely free of any predefined working hours or arrangements (Eaton, 2012). For example, skunk workers are those who work within an established organisation but are given some degree of independence and resources to enable them work without disruptions so they can provide innovative solutions for the organisation in response to the competitive market (Biron *et al.*, 2021). For other on-call workers, there is a high degree of freedom in which they are able to choose contractual terms with their employers and the resources needed to execute their “gigs” (Furtmueller *et al.*, 2011; Tudy, 2021). This contrasts with some on-call workers who do not have any organisational affiliations and are therefore vulnerable to job non-availability and low wage negotiation anchoring from potential employers (Bellesia *et al.*, 2019).

A common denominator for on-call work in its various forms is the use of digital technology. These are mostly technologies that enable on-call workers to register their availability, make contact with potential employers, negotiate wages, receive notifications of awarded contracts and so on (Laker *et al.*, 2021). These technologies also allow for synchronous modes of communication between on-call workers and their employers as they seek to deliver projects within specified requirements (Felstead and Henseke, 2017). The implication is that employers seek to engage on-call workers that are technologically connected to allow for monitoring of progress of work, which is often a challenge if workers are in different geographic zones (Marica, 2019). For on-call workers who are negatively impacted by the digital divide, further administrative costs are needed to maintain connectivity (O'Connor and Cech, 2018). Other disadvantages include the precarity of job offers and subsequent income-generation irregularity (Eaton, 2012; Jacobs and Padavic, 2015).

For on-call workers who are unaffected by the digital divide (that is, those on the “good” side of the divide), the imbalance of work availability may have positive impact, that is, with an oversupply of work but with the unintended consequence of having to face stressful conditions as they try to meet multiple project deadlines (Haley and Miller, 2015). This is shown to affect worker well-being, particularly when combined with lack of regulatory protection for on-call workers with regards to working hours (Marica, 2019). Additionally, the digital divide may be hidden as most digital applications deployed by on-call workers offer freemium models and are therefore supposedly available for every worker without prejudice to socioeconomic background. From an ANT perspective, we argue that because the digital divide also involves a heterogeneous network of various resources needed to effectively use digital technology, freemium models only deepen the divide as even more “free” resources are made available to those who are able to access it. Consequently, on-call workers who depend on freemium models are expected to deliver their jobs, while other inhibitory factors are drowned out of the conversation. We thus propose the following:

Proposition 4. On-call workers are more likely to exhibit strong responses to their technology environments because of the need to mitigate the risk of precarious income than those in regular employment.

3.4 Social distancing measures and the digital divide

With the easing of lockdown measures in many countries, social distancing measures remained (sometimes implicitly) in organisations upon return to the office (Boland *et al.*, 2020). Some measures include flow of traffic signposting within office buildings, room capacity reductions, mask mandates within offices and online meetings mostly preferred (Yuan *et al.*, 2020).

Additionally, some organisations have adopted hub-and-spoke models, while others have deployed hybrid working models (Davis, 2021). In some cases, there is a rota system for working in which employees are given specific days to be at the office (Kane *et al.*, 2021). Some technologies allow for hybrid meetings where participants can be either remote or physically present. The underpinning assumption for these socially distanced forms of meetings is that work patterns during the lockdown can continue or be merged into new post-lockdown arrangements. This assumption discounts any inconvenience that employees have overcome during the lockdown to be able to deliver work outputs. In other words, the technology environment within which employees operated, whether limiting or enabling, is not accounted for, as work-as-usual is assumed.

To this end, social distancing measures that were put in place to limit the transmission of the coronavirus held consequences for the digital divide, especially when those measures involved the use of digital technology (Yuan *et al.*, 2020). This is because they assume the availability of technological resources for all individuals, with no considerations to their unique technology environments (Choudhury, 2020). Additionally, rota systems that are established to limit the number of employees on company premises also assume that all individuals who worked at home on certain days of the week have enabling technology environments (Kane *et al.*, 2021). The implication is that the inequalities that the digital divide engenders are hidden but simultaneously perpetuated in the post-lockdown era.

For those with limiting technology environments, the easing of lockdown measures and a return to work potentially offer a way out of challenges faced. As workers on the disadvantaged side of the digital divide, a return to the office environment with its available technological resources supplies the needed technology environment for work productivity (Fosslien and West-Duffy, 2021). On the other hand, those on the advantageous side of the digital divide have greater latitude to choose flexible work arrangements as they possess the enabling technology environment to support their work activity (Choudhury, 2020). Social distancing requirements and therefore FWPs perpetuate these inequalities but also offer an opportunity for a deeper investigation into the digital divide at the individual level. We thus propose the following:

Proposition 5. Individuals with limiting technology environments are more likely to be disposed to a return to in-person work environments than those with enabling technology environments.

4. Discussion

The COVID-19 post-lockdown era places enormous burden on workers, particularly as FWPs are adopted (Boland *et al.*, 2020). Some employers have allowed their employees to either choose to work permanently from home or choose their own work schedules (Deloitte, 2021). These all signal a change in working approaches, especially in these times of uncertainty (Lever *et al.*, 2023). However, this change has inadvertently drowned out the digital divide, not only because work is now done remotely but also because the conditions that sustain remote forms of work are unequally distributed (Shockley and Allen, 2010; Adisa *et al.*, 2022). In this light, we move the digital divide away from its broad conceptualisation to something that is a lived experience, negotiated by individuals in their daily work practices (Riggins and Dewan, 2005).

Our arguments point to the agency of an individual's technology environment that can hinder or facilitate their ability to do their jobs. By agency, we make reference to the actor-network theoretical framing of the concept as an ability of a human or a non-human to act on another and elicit a response (Soga *et al.*, 2020). In so doing, we conceptualise the technology environment precipitated by the digital divide as either limiting or enabling and is one in which workers respond differently depending on their individual motivations (see Figure 1).

In this sense, we contribute to the ANT literature by illustrating how human agency in response to changes within a network of relations may be more of a gradual adaptation than about sudden action. It may not so much be about an actor directly doing “something” to another actor for the benefit of the former, depicted in Callon’s (1986) sociology of translation (in terms of power dynamics), as it is about an actor intrinsically adapting to a stimulus for its own benefit. These actor responses and, in some cases, adaptations, argued in this paper as user responses, are shown in other ways (see Beaudry and Pinsonneault, 2005), but we contribute to the ANT literature by examining these responses with respect to the digital divide.

Additionally, the actor-network theory’s approach to social phenomena in which the technological is constitutive of the social means that the digital divide at the individual level may be even more pronounced than we think. Considering that a worker’s ability to do their job depends on their heterogeneous network of relations (Ahmadi and Soga, 2022; Santoro *et al.*, 2020), unpacking such a network might reveal various elements that hinder the individual’s ability to do their job, not access to technology alone (Riggins and Dewan, 2005). The ANT lens allows us to examine the digital divide from a more micro actor-to-actor perspective beyond technological resource and capability gaps. We take this view of a network of relations as offering an opportunity to explore the drivers of user responses in different technology environments.

With the blurring of work and non-work boundaries, individuals have tended to work long hours and have suffered corresponding health challenges (Ingusci *et al.*, 2021). While some authors argue for FWP as offering a good work-life balance (Wheatley, 2012), others argue to the contrary (see Rafnsdóttir and Heijstra, 2013; Thornton, 2016). These positions point to a lack of consistency in extant literature regarding the impact of FWP on individuals in their heterogeneous networks. This is complicated by the fact that FWP is eclectic and appears in various forms. It is particularly the case in a post-COVID-19 lockdown era in which it remains unclear how organisations will choose to work (Deloitte, 2021). The lack of conceptual clarity is also worsened by the idea of the digital divide in which some individuals are fully equipped to work flexibly, and others not so much and are therefore marginalised (Hasan *et al.*, 2021).

Furthermore, a post-lockdown flexible work potentially considers work as “flexible” in that it is no longer necessitated by mandatory government rules due to COVID-19. This “flexibility” poses a conceptual challenge for us. With individuals experiencing the digital divide in some form, could work really be “flexible”, as such flexibility is hampered by other factors that may not be readily visible? The idea of “flexibility” is also contested as calls are made to regulate the practice for worker rights protection, especially with the increasing use of algorithmic monitoring systems (Bell, 2011; Wood *et al.*, 2019). “Flexibility” in this instance is no longer “flexible” when control mechanisms are introduced. Moreover, digital technologies that proudly underpin the flexible work culture are themselves inflexible, particularly when technology fails (Lucas Jr and Olson, 1994).

There is consensus in the literature that digital technology facilitates FWP, but with it are potential side effects that must not be neglected. We illuminate one of these side effects as the digital divide, which occurs in the lived experience of workers, and ultimately creates conditions for perceived lack of effort from colleagues or employers, personal stress in adapting to limiting technology environments and eventual isolation from work (Chadee *et al.*, 2021). These can, in turn, result in a sense of detachment from work as individuals struggle to do their jobs (Gordón and Rocío, 2020). Researchers are thus faced with new concerns on how to unveil the determinants of the various unknowns in the COVID-19 post-lockdown era (Matli, 2020).

4.1 Theoretical contributions

This work makes several theoretical contributions. First, it develops FWP theoretical propositions through ANT’s critical lens of the digital divide. For instance, we emphasised an

enhanced understanding of the digital divide as going beyond the physical access to technological tools and argued that the human, the computer, the Internet, the job or the job contract (if available), the home electricity, the space used for working at home and other objects that may have been displaced to make work possible at home and so on all form part of a network of relations. The implication is a difference in experience as individuals belong to different heterogeneous networks, that is, if the networks are “punctualised” – that is, seen as “acting as a single block” (Law, 1992, p. 385) or a “black box” with a known set of characteristics (Callon, 1991) – a concept rooted in ANT.

Second, it offers a relational conceptualisation of FWP. For instance, the arguments position FWP as a practice that must be understood relationally as a set of entities brought together with undetermined characteristics (Callon, 1993; Law, 2004). This is because the concept is interlaced with several unidentifiable processes that the individual must negotiate in order to sustain it.

Third, the study allows the ascription of agency to both human practitioners of FWP and the network they are a part of. For instance, ANT’s conceptualisation posits that for individuals to sustain FWP, they would need to (re)order themselves relationally in response to shifts in the heterogeneous network they are a part of. This theoretical framing of the role of the digital divide in FWP in a post-lockdown world opens up the need to consider what networks of relations individuals are part of and how those networks act and/or have changed post-lockdown. Understanding the network of relations allows us to capture the nature of the work of individual actors within it since “an actor is also a network” when we speak of actor-networks (Callon, 1991, p. 142). Following, we have shown how actor responses within a network may purely be adaptational, that is, for the actor’s own benefit, as against reactionary, that is, reacting to a direct external stimulus, the latter being what underpins Callon’s (1986) sociology of translation.

4.2 Practical implications

This study, by advancing our knowledge of FWP, also makes several practical contributions. First, we argue that the adoption of FWP raises implications for how work is designed for individual workers who may be suffering in silence due to the digital divide. Second, implications are raised for work evaluation systems for individual workers with attention to their technology environments. A “provide and pray” approach will not work as there are other factors constituting one’s technology environment. Third, the calls for regulation in order to ensure worker protection are an implicit recognition of the inherent challenges of FWPs, one of which is the digital divide. Our user response framework (Figure 1) provides a starting point for managers in organisations to begin important conversations, which would otherwise have remained hidden.

4.3 Future research directions

The arguments raised show that the adoption of FWP post-COVID-19 lockdown is as much a practical issue as it is also a research challenge. Future research could examine how the heterogeneous network of relations shape, sustain or limit workers’ ability to engage in flexible working arrangements. With regards to proposition 1, it would be useful to understand further how the digital divide plays out intra-organisationally as the assumption is that everyone is back at work in the office. Here, we propose ethnomethodological approaches for closer investigation. With reference to proposition 4, future research could examine comparatively how on-call workers and those in regular employment navigate the digital divide.

Additionally, research could consider how individuals respond to different technology environments as they work from home or remotely. Here, further conceptualisation is needed

as to what constitutes the technology environment; our ANT perspective takes a much broader view, but other theoretical lenses could narrow it down. Experimental research designs could also help explore how individuals react to a limiting or an enabling technology environment so as to gain deeper understanding into the phenomenon. Additionally, research could consider individual motivations of workers at the disadvantaged end of the digital divide as this could throw light on how user responses in such environments can help inform policy.

Furthermore, ANT's ontological assertions are not without criticism (see Elder-Vass, 2015; Shapin, 1998). For instance, the idea of generalised symmetry, explained earlier, has sparked debate. It is seen by some as anthropomorphising non-humans, with epistemological difficulties of giving "voice" to objects in research practice (see Collins and Yearley, 1992; Elam, 1999). Cresswell *et al.* (2010) recognise this challenge and suggest practical approaches to negotiating ANT research as "methodology cannot resolve the higher epistemological [and ontological] debate" (Cresswell *et al.*, 2010, p. 9). In other words, the "ANT method" of doing research could be viewed as impossible. To this end, Latour (2005) advocates tracing the heterogeneous network by "following the actor". In doing so, the researcher must consider all the various elements of the network (be they human or non-human). The implication is that researchers should consider following the actors – remote workers, on-call workers, freelancers and so on – in order to trace how they sustain their practices. It is an act of examining their context of work (Callon, 1991), as it is in that process that we understand what or how these individuals negotiate the digital divide. Finally, with the COVID-19 lockdown lifted, we believe there is scope to examine how the lockdown period hid the effects of the digital divide for individual workers in either the Global North or the Global South.

5. Conclusion

The arguments raised in this paper show the practical and theoretical issues surrounding the adoption of flexible working practice post COVID-19. We have highlighted how (in)accessibility of digital technologies alone does not constitute the digital divide, but the myriad of elements within one's environment including the technologies in question. This is of value in that the availability of technological resources for work could be taken for granted as individuals return to old habits of work pre-lockdown. By our proposed framework on user responses to digital technology environments in FWP, we extend the literature on FWP by highlighting factors that would otherwise remain hidden in the work life of the individual, and ANT by demonstrating how human and non-human agency play out in a network of relations without elements of coercion. In this sense, a human could act for their own benefit without being coerced by another as illustrated in adaptive engagement (see Figure 1).

Our proposed framework also calls for future research to examine potential inequities when it comes to technology environments. Whereas new technologies are designed to be accessible to users across the globe, we have shown that consideration also ought to be given to reducing the digital divide in the usability of those new technologies. Research could also examine the role of professional networks in safeguarding protective regulations for flexible working as well as equity in performance evaluation systems in the design of work and recruitment in a technological age. We acknowledge limitations for this paper in that it does not account for other user groups such as those with high technological adeptness or those with limited technological know-how. While we refute blanket categorisations of generational gaps, we acknowledge a limitation in this paper in that we do not account for potential variations in individual attitudes towards their technology environments, whether enabling or limiting. This leaves room for further exploration in future studies as we continue to make sense of the digital divide in contemporary organisations. More importantly, we hope this conceptual paper has laid a foundation for future empirical examination of the propositions raised.

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Connectedness between cryptocurrencies, gold and stock markets in the presence of the COVID-19 pandemic

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Abstract

Purpose – This paper analyzes the connectedness with network among the major cryptocurrencies, the G7 stock indexes and the gold price over the coronavirus disease 2019 (COVID-19) pandemic period, in 2020.

Design/methodology/approach – This study used a multivariate approach proposed by Diebold and Yilmaz (2009, 2012 and 2014).

Findings – For a stock index portfolio, the results of static connectedness showed a higher independence between the stock markets during the COVID-19 crisis. It is worth noting that in general, cryptocurrencies are diversifiers for a stock index portfolio, which enable to reduce volatility especially in the crisis period. Dynamic connectedness results do not significantly differ from those of the static connectedness, the authors just mention that the Bitcoin Gold becomes a net receiver. The scope of connectedness was maintained after the shock for most of the cryptocurrencies, except for the Dash and the Bitcoin Gold, which joined a previous level. In fact, the Bitcoin has always been the biggest net transmitter of volatility connectedness or spillovers during the crisis period. Maker is the biggest net-receiver of volatility from the global system. As for gold, the authors notice that it has remained a net receiver with a significant increase in the network reception during the crisis period, which confirms its safe haven.

Originality/value – Overall, the authors conclude that connectedness is shown to be conditional on the extent of economic and financial uncertainties marked by the propagation of the coronavirus while the Bitcoin Gold and Litecoin are the least receivers, leading to the conclusion that they can be diversifiers.

Keywords Connectedness, Cryptocurrencies, COVID-19 crisis, Gold, Spillover

Paper type Research paper

1. Introduction

Almost all markets have witnessed strong upheavals with the spread of the coronavirus disease 2019 (COVID-19) pandemic shifting to the major digital currencies, the stock indices, the oil price and commodities. The shifts in the mentioned asset volatility have proved costly for many markets. In fact, the increase of volatility has put business operations at the risk of affecting the financial system. Therefore, the global economy is in turmoil as a result of concerns over the coronavirus epidemic. No company is immune to the challenges caused by the health crisis; besides, there are understandable concerns about the damage caused to the worldwide economy. During the propagation of the COVID-19 worldwide, an insurmountable fear was behind a global stock market crash. The 2020 stock market crash, also referred to as the Coronavirus Crash, was a major and sudden global stock market crash that began on 20 February 2020.



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The impact of the COVID-19 on the volatility of markets exceeded the one caused by the 2008 global financial crisis and continues to have an effect (Zhang and Hamori, 2021a). The pandemic created an unprecedented level of risk, such as oil triggering stock markets, which was accompanied by heavy losses for investors. As a result, the Paris Stock Exchange fell from 8.39% to 4,707.91 points at the close, its worst session since 2008 [1]. Then, the Wall Street had its worst downturn since 2008 as the coronavirus fears have wiped off almost 32%, or roughly \$9 trillion, from the value of the benchmark S&P index since its record closing high on February 19, 2020 [2]. Moreover, the Dow Jones entered “bear market” territory [3] as it fell by 1,465 points or 5.9%. This was enough to put it more than 20% lower than the index recent high point on 12 February 2020. On the other hand, the Nikkei reached its lowest point in 30 years amid worsening virus fears [4]. Recent research studies evaluated and quantified the unexpected outbreak effects of the global pandemic on the stock markets’ performance and proved its reducing effect in the USA (Yousfi *et al.*, 2021), in the African countries (Owusu Takyi and Bentum-Ennin, 2020), and in the USA, Japan and Germany, where the impact of the COVID-19 exceeded that of the 2008 financial crisis (Zhang and Hamori, 2021a), etc.

On the other hand, although they are new digital currencies, which established a new distributed payment system on the basis of crypto-graphical protocols which can ensure anonymity, low cost and fast speed of peer-to-peer transactions, cryptocurrencies are not immune to this financial crash caused by the new pandemic. Therefore, the major cryptocurrencies has plummeted to its lowest level since March as a stronger dollar and investor nerves strip off nearly \$140bn in cryptocurrency market cap. For example, over two days in January, it plunged to 21%, which is its biggest decline since March 2019. On the other hand, Ethereum fell to 12%. The smaller coins, XRP and Litecoin shed about 18% each [5]. The BTG, which was created in 2017 to counter the centralization of Bitcoin, was notably volatile during 2020 with record in March 2020 [6]. In fact, several researchers, such as Mnif *et al.* (2020), Demir *et al.* (2020), Umar and Gubareva (2020), Bergeron *et al.* (2020), Salisu and Ogbonna (2021) and Yarovaya *et al.* (2021), studied the impact of the COVID-19 on the cryptocurrency market efficiency.

While correlations among most types of assets significantly increased, gold was the only asset to increase in value in 2020. At the time of the market turmoil, investors are more interested in gold as a safe-haven asset (Baur and Lucey, 2010; Shahzad *et al.*, 2019). This precious metal is unconnected with other assets (Baur and Lucey, 2010) and is still considered to be a zero-beta asset (McCown and Zimmerman, 2006). Among all the commodities, gold has the longest duration in the high volatility regime (Choix and Hammoudeh, 2010). In fact, the rising feeling of fear and the investors’ pessimism observed during crises caused an increase of demand for gold, which results in an increase of volatility (Ghorbel, 2018). Moreover, several studies, such as those of Baur and McDermott (2010) and Creti *et al.* (2013), proved the safe-haven role of gold, particularly during the stock market crises (Anand and Madhogaria, 2012; Arouri *et al.*, 2015; Chkili, 2016; Chen and Wang, 2017; Junttila *et al.*, 2018).

Given this volatile time, we intend to study the time-varying volatility and the volatility transmission mechanisms across the most widely traded cryptocurrencies, stock indices and gold. This would be essential for both international investors and policymakers. In fact, so far, the common consensus has proven the weak correlations between cryptocurrencies and other assets. However, several observations allow revisiting this consensus (Kristoufek, 2015; Yermack, 2013a, b; Blau, 2017; Bouri *et al.*, 2018a; Jiang *et al.*, 2021). Therefore, we study the pairwise and total connectedness among the stock indices, the major cryptocurrencies and gold. Thus, our empirical study sheds lights on the literature regarding the linkages between financial and commodity markets. We particularly use data relevant for eight popular cryptocurrencies, namely Bitcoin, Dash, Ethereum, Monero, Maker, Bitcoin Gold, Litecoin and Ripple, stock indices for seven developed countries (American index S&P500,

British index FTSE, Japanese index Nikkei, German index Dax 30, Canadian index SP/TSX, French index CAC40 and Italian index FTSE MIB) and gold price.

In retrospect, this study goes one step further and contributes to the existing literature in a number of ways. First, while several research studies on the relationship between the Bitcoin and other traditional assets emerged to assess whether the Bitcoin can be used as a safe-heaven, a diversifier or a hedging asset (see, e.g. Brière *et al.*, 2015; Dyhrberg, 2016; Bouri *et al.*, 2018a, b, c; Baur *et al.*, 2018a, b; Corbet *et al.*, 2018; Feng *et al.*, 2018; Giudici *et al.*, 2018; Ji *et al.*, 2018; Symitsi and Chalvatzis, 2019), our study focuses on the eight major cryptocurrencies. Second, our analysis during the COVID-19 pandemic enabled us to revisit the common consensus regarding the weak correlation between the cryptocurrencies and the stock markets and also detect the risk of contagion. Third, our study shows to what extent the relationship between gold, the stock indexes and the cryptocurrencies can be understood in a systemic way. Fourth, our hedging effectiveness analysis is set to assess the roles of the cryptocurrencies, the stock indexes and gold in a crisis period. Doing so, we extend the correlation analysis and help portfolio hedgers to make optimal portfolio allocations, engage in risk management and forecast future volatility in financial assets and commodity markets.

We proceed as follows. The second section will present the literature review. In section 3, we discuss the construction of our sample and introduce the connectedness method proposed by Diebold and Yilmaz (2014) to investigate the investors' strategies in relation to cryptocurrencies, stock indices and gold, where we propose the data description and the summary statistics. In section 4, we provide results for the static and dynamic information spillover effect, and finally, in section 5, we conclude the paper.

2. Literature review

A large strand of literature has focused on the mutual dependencies between cryptocurrencies, stock indexes, oil and other commodities (Kurka, 2017; Corbet *et al.*, 2018; Tiwari *et al.*, 2019, 2020; Ji HoKwon, 2020; Yitong Hu *et al.*, 2020; Ahsan Bhuiyan *et al.*, 2021; Yonghong Jiang *et al.*, 2021; Lahiani *et al.*, 2021; Caferri and Vidal-Tomás, 2021). This line of thoughts is interesting and considered as a new topic because it especially considers the increased integration between financial markets in crisis period. Therefore, studying connectedness among different assets is important for two major reasons. First, the portfolio performance depends on the investor's portfolio selection and on the structure of its components (Baumöhl *et al.*, 2018). Second, policymakers could benefit from the information transmitted across assets to broadcast their policies (Ciner *et al.*, 2013). This explains the existence of a large empirical literature trying to better understand the mutual dependencies among various asset classes.

Moreover, recent studies have concentrated on the safe haven and the various roles of cryptocurrencies with respect to traditional assets (Bouri *et al.*, 2018a, b, c; Selmi *et al.*, 2018; Urquhart and Zhang, 2019), especially with the stock indices because of their universality (Dyhrberg, 2016; Bouri *et al.*, 2018a, b, c, 2020; Jiang *et al.*, 2021). Using numerous methods and techniques, it was proved that the major cryptocurrencies are in general isolated from conventional assets (Dyhrberg, 2016; Aslanidis *et al.*, 2019; Charfeddine *et al.*, 2020; Bouri *et al.*, 2020; Ghorbel and Jeribi, 2021a). However, the novel approach is to challenge this common consensus regarding the weak correlation between cryptocurrencies and the stock markets. This is explained by the fact that the cryptocurrency prices are determined by the same standard fundamental factors as in traditional assets (Kristoufek, 2015), besides their speculative nature (Yermack, 2013a, b; Blau, 2017; Bouri *et al.*, 2018a, b, c) may increase information transmission, risk contagion and the downturn between cryptocurrencies and the stock markets during the COVID-19

pandemic. For their part, Jiang *et al.* (2021) proved their dependence. In fact, it becomes interesting to challenge this traditional consensus in crisis period marked by the spread of a new global pandemic COVID-19, which destabilized the economic and financial system in the first quarter of 2020.

Furthermore, several studies presented some empirical findings on connectedness between cryptocurrencies, stocks and other assets. In this sense, Kurka (2017) documented a very low connectedness between Bitcoin and gold, oil, S&P500 and treasury notes. Moreover, Corbet *et al.* (2018) confirmed that Bitcoin, Ripple and Litecoin are isolated from other financial and economic assets, such as VIX, Bond, Gold, FX, S&P500 and GSCI. More recently, Tiwari *et al.* (2019) have used a copula-ADCC-EGARCH model to examine the time-varying asymmetric correlation between cryptocurrencies and stock returns in the USA markets. They found that Litecoin is the most efficient hedge asset against the risk in the USA stock market. While for the BRICS and developed countries, Lahiani *et al.* (2021) investigated the dependence between cryptocurrencies and the stock market returns and found evidence for the predicting role of BSE 30 for cryptocurrencies while the Bitcoin future reshaped the tail dependence between cryptocurrencies and the stock returns. As for Mokni *et al.* (2020), they took into account the economic policy uncertainty and proved its negative effect on the dynamic conditional correlation between Bitcoin and the USA stock markets only after the Bitcoin crash of December 2017. However, before the crash, they documented the existence of a positive association between the economic policy uncertainty and the weight of Bitcoin in the portfolio. Furthermore, in order to classify cryptocurrencies, Ji HoKwon (2020) proved that they are an alternative for a medium of exchange and a means of investment being far from a commodity. For their part, Ahsan Bhuiyan *et al.* (2021) also tried to identify the interrelationship between Bitcoin and the different asset classes. In fact, they found evidence of a strong bidirectional causality between gold and Bitcoin and a neutral relationship with the aggregate commodity index, crude oil, and the US dollar index. This relative isolation of Bitcoin proves its quality as a diversifier. As for Yonghong Jiang *et al.* (2021), they emphasized this finding through a novel quantile coherency approach. They proved that cryptocurrencies failed to be a strong hedge or safe haven against the stock markets while they could be diversifiers especially during the March 2020 market recession. To draw generalized conclusions, Yitong Hu *et al.* (2020) investigated the impact of the investor's attention allocation on the worldwide stock returns during extreme the Bitcoin movements. They found that these shock events decrease worldwide the stock returns especially in the emerging countries. Considering the COVID-19 pandemic, Caferra and Vidal-Tomás (2021) studied the behavior of cryptocurrencies and stock markets. They found that the price dynamics during the pandemic depends on the type of the market. In other words, despite the fall of both cryptocurrencies and stock indexes, cryptocurrencies promptly rebounded, while stock markets were trapped in the bear phase. In the same line of thoughts, Ghorbel and Jeribi (2021a) investigated the relationships between the volatilities of five cryptocurrencies, American indices (S&P500, Nasdaq, and VIX), oil, and gold and found that cryptocurrencies are diversifiers during the stability period but not a safe haven for US investors during the coronavirus crisis.

The previous empirical works have examined the volatility connectedness or spillover effects across different financial assets, which motivated us to use a newly developed systemic framework to investigate the volatility connectedness in the cryptocurrency market, stock market and gold during the crisis period. Therefore, this study is intended to fill the gap and explicitly incorporate these issues to revisit the crypto-stock-gold time-varying relationship from a global perspective. This paper also aims at answering the following questions: If the global financial markets, the crypto-currency market and gold are directly connected with financial markets, which assets can be diversifiers for investors?

3. Methodology

In this section, we will present the multivariate time-series approach proposed by Diebold and Yilmaz (2009, 2012, 2014) to investigate the crypto-gold-stock index relationship from a global perspective. In fact, the authors proposed an analytical framework that makes it possible to produce different types of connectivity from the same method: exposure, influence or global connectivity. Moreover, they made the data of different entities interact in a VAR/VECM model and used generalized variance decomposition as the network adjacency matrix. This matrix gives an almost complete description of a network at a given time. The authors applied this method recursively to obtain the evolution of connectivity over time, which enabled them to paint a picture of the network of the major US financial institutions from a series of financial volatilities then analyze the changes in this network as the crisis unfolds. In fact, this approach fits our topic since our objective is to study the connectedness with network among the major cryptocurrencies (Bitcoin, Dash, Ethereum, Monero, Maker, Ripple, Litecoin and Bitcoin gold), the G7 stock indexes and the gold price over the COVID-19 pandemic period. We therefore used data for eight major cryptocurrencies, seven stock indexes and gold during 2020. Like Zhang and Hamori (2021b), we used the returns measured by the changes in the daily prices.

To account for interdependence in financial markets, Diebold and Yilmaz (2009) introduce a simple measure of connectedness called the multivariate time-series approach. This approach based on a vector autoregressive model (VAR) and the generalized forecasting variance decomposition method which is used to look at spillover effects in the global financial market. Due to its simplicity and flexibility, this connectedness measure has been widely applied in information spillover (Diebold and Yilmaz, 2012; Zhang and Hamori, 2021b; Ji *et al.*, 2018). The detailed procedure is as follows.

First, consider a K variable VAR model with p lagged number:

$$y_t = \sum_{i=1}^p \Phi_i y_{t-i} + \varepsilon_t \quad (1)$$

where y_t is a $(K \times 1)$ vector of variables at date t , Φ_i is autoregressive coefficient matrix and ε_t is a $(K \times 1)$ vector of error terms that are assumed to be serially uncorrelated. Given a stationary covariance of the VAR system, a moving average representation is written as $y_t = \sum_{j=0}^{\infty} A_j \varepsilon_{t-j}$, where the $n \times n$ coefficient matrices $A_j = \Phi_1 A_{j-1} + \Phi_2 A_{j-2} + \dots + \Phi_p A_{j-p}$ with A_0 is the $n \times n$ identity matrix and $A_j = 0$ for $j < 0$.

To calculate the variance contribution of variable j to variable i , $\theta_{ij}(H)$, Koop *et al.* (1996) and Pesaran and Shin (1998) proposed the following H -step-ahead generalized forecast error variance decomposition:

$$\theta_{ij}(H) = \frac{\sigma_{jj}^{-1} \sum_{h=0}^{H-1} (e_i' A_h \sum e_j)^2}{\sum_{h=0}^{H-1} (e_i' A_h \sum A_h' e_i)} \quad (2)$$

Σ is the variance matrix of the vector of errors ε , σ_{jj} is the standard deviation of ε_j and e_i is a selection vector with a value of one for the i^{th} element, and zero elsewhere. Because the row sums of the variance decomposition matrix are not necessarily equal to one, each entry in the matrix $\theta(H)$ is normalized by the row sum and hence the row sum will be equal to one. Each entry in the $k \times k$ matrix $\theta(H) = [\theta_{ij}(H)]$ measures the contribution of variable j to the forecast error variance of variable i at horizon H , $C_{i \leftarrow j}^H$. Note that in general $C_{i \leftarrow j}^H \neq C_{j \leftarrow i}^H$, hence, the main diagonal elements of the $\theta(H)$ matrix represent the own-variable contributions, while the off-diagonal elements represent the cross-variable contributions. Table 1 illustrates the various connectedness measures and their relationships.

Finally, net pairwise connectedness, directional connectedness and total connectedness can be calculated using the generalized forecast error variance decomposition approach (FEVD).

3.1 Net pairwise connectedness

Due to the asymmetric effect between two variables and because $C_{i \leftarrow j}^H \neq C_{j \leftarrow i}^H$, we measure the net pairwise connectedness as the difference between $C_{i \leftarrow j}^H$ and $C_{j \leftarrow i}^H$. Such difference, $C_{i \leftarrow j}^H - C_{j \leftarrow i}^H$, measures the net spillover effect from variable j to variable i . Based on net pairwise connectedness, a directional connectedness network can be built. In such network, each node represent an index, and a directional edge from j to i exists in the network if $C_{i \leftarrow j}^H - C_{j \leftarrow i}^H$ is positive.

3.2 “From” and “To”, the total directional connectedness

In Table 1, “From” column and “To” row measure the total directional connectedness from and to each market. Total directional connectedness “From” is defined as the information spillover from other markets to one market and this number is between 0 and 1. Whereas, total directional connectedness “To” represents the information spillover from one market to other markets, and this number is not bounded by 1.

3.3 Net total directional connectedness

The difference between total directional connectedness “To” and “From” of one market measures the net information spillover contribution.

3.4 Total connectedness for the system

The average of total directional connectedness “From” or “To” for all the variables measures the total connectedness of the system, which is a representative indicator of the market integration and convergence.

The full-sample connectedness approach does not help us understand the connectedness dynamics, for this reason, Diebold and Yilmaz (2009) extend this measure by allowing for time-varying spillover effects. In the dynamic version of the measure, the used method

	y_1	y_2	..	y_K	<i>From</i>
y_1	$C_{1 \leftarrow 1}^H$	$C_{1 \leftarrow 2}^H$	..	$C_{1 \leftarrow K}^H$	$F_{1 \leftarrow j} = \sum_{j=1}^K C_{1 \leftarrow j}^H, j \neq 1$
y_2	$C_{2 \leftarrow 1}^H$	$C_{2 \leftarrow 2}^H$	..	$C_{2 \leftarrow K}^H$	$F_{2 \leftarrow j} = \sum_{j=1}^K C_{2 \leftarrow j}^H, j \neq 2$
:	:	:	:	:	:
y_K	$C_{K \leftarrow 1}^H$	$C_{K \leftarrow 2}^H$	..	$C_{K \leftarrow K}^H$	$F_{K \leftarrow j} = \sum_{j=1}^K C_{K \leftarrow j}^H, j \neq K$
<i>To</i>	$T_{i \leftarrow 1} = \sum_{i=1}^K C_{i \leftarrow 1}^H$ $i \neq 1$	$T_{i \leftarrow 2} = \sum_{i=1}^K C_{i \leftarrow 2}^H$ $i \neq 2$	..	$T_{i \leftarrow K} = \sum_{i=1}^K C_{i \leftarrow K}^H$ $i \neq K$	$\frac{1}{K} \sum_{i,j=1}^K C_{i \leftarrow j}^H$ $i \neq j$
<i>Net</i>	$T_{i \leftarrow 1} - F_{1 \leftarrow j}$	$T_{i \leftarrow 2} - F_{2 \leftarrow j}$	..	$T_{i \leftarrow K} - F_{K \leftarrow j}$	

Note(s): Following Diebold and Yilmaz (2009, 2014) and Zhang (2017), H is set to be 10 days

Table 1.
Connectedness table
based on the FEVD
approach

remains the same, but it is applied in the overlapping sub-samples. In such case, the dynamic measure of connectedness is different from a simple average of the rolling-window measures, due to the fact that the latter is obtained from different VARs models. In the dynamic version, we will be able to analyze how individual components contribute to the system over time and how much information it gains from it. Also, the dynamic model allows us to show the time-varying connectedness in the system. In this paper, the choose of the size of the rolling window is selected based on guidelines indicating that it should not be too large or too small; otherwise, it leads to estimations bias. Therefore, we choose a rolling-window size of approximately 30% of daily observations (which equal to 135) [7].

We would note that several studies on time-varying parameter vector autoregressions (TVP-VAR) dynamic connectedness have progressively begun to appear (see, Gabauer and Gupta, 2018; Antonakakis *et al.*, 2018, 2019a, b, c; Chatziantoniou *et al.*, 2022). Specifically, Antonakakis and Gabauer (2017) and Korobilis and Yilmaz (2018) both proved evidence of the superiority of TVP-VAR connectedness estimation.

4. Data and empirical results

This section mainly presented the data and analyzes the static and dynamic spillover effect across global financial system for Gold, eight major cryptocurrencies (Bitcoin, Dash, Ethereum, Monero, Litecoin, Bitcoin Gold, Maker and Ripple) and major stocks of France, USA, Britain, Italy, Canada, Germany and Japan. We will focus on connectedness at a variety of levels, from pairwise connectedness for cryptocurrencies, stock indices and Gold to the total connectedness and from the static connectedness that measures the unconditional average of connectedness over the full sample to the dynamic that represents the conditional connectedness and its movements during a crisis period.

The descriptive statistics of these return series are reported in Table 2 while the summary statistics of cryptocurrencies show that evidently, the unconditional variance of the Bitcoin is the lowest volatility, followed by that of Ripple. This means that the Bitcoin exhibits the lowest volatility and thus remains the safest currency vis-à-vis the other studied cryptocurrencies; besides, it offers the highest average returns. Meanwhile, Bitcoin Gold has experienced the lowest return and the highest volatility. This indicates that it is the most volatile and thus, the riskiest. Amid indices, Dax 30 and S&P500 offer the highest average returns and FTSE the

Variables	Mean	Standard deviation	Min	Max	Skewness	Kurtosis	Jarque-Bera
BITCOIN:BTC	0.226	4.833	-49.728	20.078	-2.508	29.161	19345
Dash	-0.039	6.520	-50.029	56.488	0.600	22.655	5028.9
ETHEREUM:ETH	0.169	5.823	-57.987	21.063	-2.414	25.229	2143.5
MONERO:XMR	0.090	5.591	-51.954	17.630	-2.192	18.888	2781
LITECOIN:LTC	-0.234	5.144	-14.723	29.062	0.586	4.290	4872.7
BITCOIN GOLD:BTG	-0.268	6.570	-54.495	71.658	1.938	46.286	1982.4
MAKER: MKR	-0.101	6.552	-81.821	31.419	-4.233	60.814	37815.8
RIPPLE: XRP	-0.106	4.995	-18.813	32.182	1.123	7.492	10542.3
Gold	0.092	1.027	-4.737	5.600	0.318	6.746	428.9
FTSE	-0.018	1.456	-11.512	8.667	-1.470	14.893	18543
CAC40	0.018	1.624	-13.098	8.056	-1.766	14.642	14287.1
FTSEMIB	0.026	1.805	-18.541	8.549	-3.341	33.005	13982.7
DAX30	0.049	1.649	-13.055	10.414	-1.156	15.404	17251.6
NIKKEI	0.047	1.150	-5.128	5.972	-0.085	4.085	20465
SP/TSX	0.028	1.652	-13.176	11.294	-1.801	26.481	21587.1
S&P500	0.049	1.773	-12.765	8.968	-0.996	13.576	31578.2

Table 2.
Descriptive statistics

lowest return (even negative). Besides, the FTSEMIB has the highest volatility and NIKKEI the lowest one. This means that the NIKKEI exhibits the lowest volatility and thus remains the safest index while FTSEMIB is the riskiest. Moreover, compared to all cryptocurrencies and indices, gold presents the lowest volatility. It is a safe investment especially during crisis periods. Thus, we join Ghorbel and Jeribi (2021a, b) and Fakhfekh *et al.* (2021), who showed that gold is a safe haven during the COVID-19 pandemic period.

The skewness statistics demonstrate that marginal distributions are asymmetrical to the left for Bitcoin, Ethereum, Maker, Monero and all stock indices for which the values are negative, except for the Dash, Litecoin, Bitcoin Gold, Ripple and gold. These positive values suppose that the marginal distributions are asymmetrical to the right. Then, the kurtosis statistics is used in order to test for the existence of heavy-tailed or light-tailed relative to a normal distribution. The obtained high values confirm the existence of fat tails in return distributions except for Litecoin, Ripple, gold and Nikkei with low values. Therefore, the assumption of Gaussian returns is rejected by the Jarque–Bera test for all digital and financial assets. All the cryptocurrencies and financial assets (gold and stock indices), as evidenced by the kurtosis and Jarque–Bera’s tests are far from the normal distribution.

4.1 Static analysis of connectedness network for stocks, gold and cryptocurrencies

Table 3 summarizes the estimation results of the static connectedness measures for each stock, cryptocurrency and gold, issued from the TVP-VAR model to study the fear connectedness and the risk transfer. The total connectedness in this VAR system is 59.3%, which is mainly due to the close link among the major stocks and cryptocurrencies and the global financial system. This indicates how much spillover effects exist within this system and that cryptocurrencies and stocks are not independent from the global financial system. The average influence of the stock indices is approximately 82.01%, while the average influence of cryptocurrencies is approximately 45.66%. In fact, the large value of the stock indices shows that the international stock market spillovers are more important than those of the cryptocurrency market as a source of market fluctuations.

For cryptocurrencies, when we consider pairwise connectedness, we notice that only the contributions of Bitcoin, Dash, Ethereum and Monero are around 36% to the global system volatility, and consequently are overtaken by the information system. On the other hand, the contributions of Litcoin, Bitcoin Gold, Marker and Ripple are more important as they exceed 75%, except for Maker (52.8%). Moreover, we found that Litecoin is the least receiver from other cryptocurrencies. On the other hand, among the stock indices, we found that their own contributions are near 20%, except for SP 500 (0.077), which is overtaken by the system with an average volatility transmission of 78.4%. However, the pairwise connectedness values show that the contributions of CAC40, FTSE, FTSE MIB, DAX30 AND SP/TSX to the studied stocks range from 13% to 24%, while the contributions of NIKKEI and S&P500 to other stocks are less than 8%. According to the pairwise connectedness analysis, Litecoin is a diversifier in a cryptos’ portfolio. Then, regarding gold, it becomes visible that it is a diversifier for cryptos. Besides, for a crypto and stocks portfolio, we found that the least transmitters of volatility are Dash, as a cryptocurrency and DAX 30, as a stock index. Table 3 indicated that the French index (CAC 40) is a diversifier in a portfolio of stocks and gold. Finally, for a stock index portfolio, FTSEMIB is the least receiver and so is a diversifier in this case. It is worth noting that in general, cryptos are diversifiers for a stock index which helps reduce volatility, especially in COVID-19 crisis. These findings will be proved checked through the following volatility connectedness analysis. The net connectedness study shows that Bitcoin contributes 81.3% to the total variation in this system. However, this system contributes 63.1% of the variation in Bitcoin returns, which results in the highest positive net

Table 3.
Static
connectedness table

names	BTC	Dash	ETH	XMR	LTC	BTG	MKR	XRP	Gold	FTSE	CAC40	FTSE	MB	DAX30	Nikkei	SP/ TSX	S&P500	From
BTC	0.369	0.122	0.279	0.168	0.004	0.005	0.011	0.003	0.002	0.006	0.003	0.003	0.003	0.003	0.006	0.008	0.008	0.637
Dash	0.140	0.385	0.144	0.218	0.002	0.014	0.014	0.006	0.006	0.009	0.007	0.010	0.010	0.009	0.016	0.013	0.008	0.615
ETH	0.281	0.116	0.369	0.148	0.006	0.003	0.012	0.004	0.005	0.010	0.005	0.005	0.005	0.006	0.013	0.009	0.009	0.637
XMR	0.171	0.201	0.155	0.362	0.004	0.009	0.009	0.009	0.005	0.010	0.007	0.009	0.009	0.008	0.022	0.010	0.009	0.638
LTC	0.004	0.005	0.006	0.011	0.756	0.014	0.008	0.015	0.002	0.031	0.036	0.032	0.032	0.028	0.020	0.023	0.009	0.244
BTG	0.015	0.045	0.018	0.005	0.011	0.788	0.048	0.016	0.006	0.005	0.007	0.004	0.004	0.005	0.010	0.013	0.005	0.212
MKR	0.020	0.079	0.024	0.012	0.009	0.234	0.528	0.007	0.009	0.011	0.015	0.011	0.011	0.011	0.012	0.017	0.002	0.472
XRP	0.032	0.020	0.027	0.029	0.022	0.025	0.023	0.767	0.012	0.004	0.007	0.011	0.011	0.006	0.005	0.006	0.005	0.233
Gold	0.014	0.008	0.016	0.009	0.004	0.005	0.013	0.008	0.679	0.036	0.042	0.034	0.034	0.043	0.032	0.044	0.013	0.321
FTSE	0.015	0.008	0.018	0.009	0.004	0.002	0.002	0.004	0.007	0.223	0.174	0.160	0.160	0.159	0.047	0.154	0.013	0.777
CAC40	0.016	0.007	0.020	0.008	0.005	0.002	0.002	0.003	0.004	0.161	0.204	0.182	0.182	0.185	0.049	0.133	0.018	0.796
FTSEMIB	0.022	0.010	0.029	0.012	0.006	0.003	0.003	0.005	0.006	0.146	0.180	0.226	0.226	0.169	0.041	0.134	0.009	0.774
DAX30	0.015	0.006	0.019	0.007	0.006	0.001	0.002	0.003	0.008	0.155	0.195	0.179	0.179	0.211	0.050	0.130	0.013	0.789
NIKKEI	0.013	0.009	0.012	0.010	0.006	0.002	0.003	0.004	0.007	0.118	0.136	0.113	0.113	0.138	0.331	0.082	0.017	0.669
SP/TSX	0.030	0.015	0.033	0.018	0.004	0.005	0.003	0.004	0.007	0.146	0.146	0.166	0.166	0.134	0.035	0.240	0.016	0.760
S&P500	0.028	0.010	0.032	0.013	0.006	0.003	0.002	0.003	0.005	0.136	0.145	0.167	0.167	0.137	0.050	0.186	0.077	0.923
To	0.813	0.661	0.831	0.676	0.097	0.327	0.155	0.093	0.092	0.984	1.105	1.088	1.088	1.041	0.407	0.962	0.154	0.593
Net	0.182	0.046	0.200	0.038	-0.147	0.115	-0.317	-0.140	-0.230	0.207	0.308	0.314	0.314	0.252	-0.262	0.201	-0.769	

connectedness of Bitcoin relative to the system, 18.2%. This implies that Bitcoin is a significant net transmitter of volatility connectedness and even has larger a greater contribution of volatility spillovers to others. Moreover, Bitcoin price changes contribute more information to the system than they gain from. We also noted that XRP is the lowest contributor to the total variation in this system, with 9.3% while it receives up to 23.3%, which results in a negative net connectedness of XRP relative to the system. The global crypto-currency market is dominated by two major cryptocurrencies, namely, Bitcoin and Ethereum, which contribute on average over 80% to the system and are all net contributors.

In fact, among the stock indices, CAC 40 is the most significant contributor to the total variation in this system; meanwhile, it receives 79.6% from the system, which results in a positive net connectedness relative to the system, with 30.8%. On the other hand, S&P500 is the lowest contributor to the volatility of the system, with 15.4%; meanwhile, it receives the highest contribution from system 92.3%. Consequently, S&P500 is a significant net receiver of volatility connectedness and even have larger gain of volatility spillovers among others. The global stock market is dominated by four major cryptocurrencies, including CAC40, FTSEMIB, DAX30 and SPTSX, which contribute on average over 90% to the system and they are all net contributors. Finally, for gold, we observe that it is the lowest contributor, with only 9.2% to the total variation in this system compared to cryptocurrencies and stock market indices but the system contributes up to 32.1% of the variation in gold returns, which results in a negative net connectedness of gold relative to the system -23% . This implies that gold is a significant net receiver of volatility connectedness.

To conclude the static connectedness of system, we can say that Bitcoin gold is the least receiver of volatility from the global financial system and Monero is the greatest receiver. This finding indicates that Bitcoin Gold is less vulnerable to the volatility shocks transmitted from the other seven cryptocurrencies, while Monero is the most vulnerable. Bitcoin Gold aimed at offsetting the limits of Bitcoin. It is a safe haven for the Bitcoin, which means that it was created by separating from some existing blocks of the Bitcoin blockchain. Bitcoin Gold has kept some of its promises by offering faster processing times than Bitcoin and introducing total anonymity. On the other hand, unlike most new cryptocurrencies, the Monero is not a clone of the Bitcoin, but it is based on a different cryptographic process which works entirely in peer-to-peer and uses an original system called “ring signatures”.

Among the stocks, we find that S&P500 is the most vulnerable to the shocks and that CAC 40 is the most significant transmitter of volatility to the system. Despite its low volatility, equity market sensitivity remains strong. In fact, during the third quarter of 2020, equity markets remained fairly stable but very sensitive despite the continued recovery of the global economy since the second quarter slowdown. This translates into significant short-term market fluctuations in recent times in response to unforeseen market events. Moreover, the events causing these market turbulences are likely to occur regularly in the future, but with varying degrees of severity.

4.2 Dynamic analysis of connectedness spillover for stocks, gold and cryptocurrencies

The basic full sample connectedness measure is extended to allow for time-varying spillover effects. In this vein, Diebold and Yilmaz (2009) used a rolling-window approach in order to study the dynamic connectedness on top of the static full sample. In fact, the full-sample and unconditional analysis provided a good characterization for volatility connectedness from an average and static despite the changes that occurred in the financial market during crisis period marked by the propagation of the coronavirus, which requires a specific analysis. For example, different reactions of countries through governmental responses influenced the performance of cryptocurrencies, stock indices and gold. By using a single fixed-parameter model, these movements would be ignored. To get a better understanding, we plot total

connectedness over 2020 to measure its long-term trends and periodic fluctuations. We began in Table 4 with the analysis of the dynamic connectedness measures for a full sample. The total connectedness in this VAR system is 72.9%, which is higher than the static connectedness. In fact, this high value represents high spillover effects that exist within this system and that cryptocurrencies and stocks are significantly dependent on the global financial system. For their part, Aydoğan *et al.* (2022) explained this by the existence of a strong interaction between the returns and the volatility of the G7 stock markets and cryptocurrency market.

A deep study of net connectedness gave results which show that among cryptocurrencies, the Bitcoin, Dash, Monero and Ethereum are net transmitters of volatility to the system, while Bitcoin Gold, Litecoin, Ripple and Maker are net receivers. This finding does not significantly differ from that of the static connectedness spillover where Bitcoin Gold becomes a net receiver. Regarding the stock market, we found that Nikkei and SP 500 are net receivers of volatility from the global system while the rest of the studied stocks, such as CAC40, DAX 30, FTSE, FTSE MIB and SP/TSX, are net transmitters, which contradicts the findings of Lahiani *et al.* (2021), who proved the leading role of S&P500 in predicting stock returns. Finally, gold is found to be a net receiver although its own contribution to volatility is overtaken by the market ($41.4\% < 58.6\%$) and in the dynamic analysis its own contribution (67.9%) is higher than the markets influence (32.1%) in the static analysis.

Besides, we plot total connectedness over 2020 to measure its trend and periodic fluctuation. The rolling total volatility connectedness plot is shown in Figure 1, which presents some patterns showing that the connectedness in this system is changing over time, as it ranges from a high volatility of 94% to a low volatility of 67%. We can remarkably identify in the total spillover plot three shocks during crisis periods marked by the propagation of COVID-19. Even though the shock has lost scope, the volatility connectedness was maintained after the third quarter at the average level of 76%.

Thus, we confirm the previous findings of Jeribi and Kammoun Masmoudi (2021) whose empirical results proved that the stock markets as well as the crypto market responded to COVID-19 through a disturbing volatility. Therefore, we can conclude that, both the stock market and cryptocurrency returns are changing in the short and long run during the COVID-19 crisis period, Jeribi *et al.* (2021).

In Figure 2, we present the dynamic directional volatility connectedness from each of the eight cryptocurrencies, seven stocks and gold to others (corresponding to the “directional to others”). It can be seen that the to-connectedness or spillovers from each cryptocurrency fluctuate between 9% and 80% most of the time. However, the directional spillover fluctuates widely during violent times and sometimes exceeds 100%. Moreover, the scope of connectedness is maintained after the shock for most of cryptocurrencies except for Dash and Bitcoin Gold, which join the previous level. As for the stocks, the to-connectedness ranges from 15% to more than 100%. Furthermore, we noted that a high spillover is detected for all the studied stocks but a loose scope after the crisis period, which almost returns to the normal values except for Nikkei and SP 500. In fact, the great fluctuations mainly occurred in July 2020. Therefore, we can conclude that cryptocurrencies are more sensitive to shocks than to stock indices being longer affected.

Figure 3 presents the dynamic directional volatility connectedness from the system to each eight cryptocurrencies, seven stocks and gold (corresponding to the “directional from others”). They vary visibly over time and also fluctuate violently especially during crisis period. Interestingly, we note that global system transmission of volatility hold even after the shock that occurred in 2020 for cryptocurrencies, stock indices and gold. This finding does not hold for Bitcoin Gold where we observe a clear decline of volatility reception. This can be explained by the fact that Bitcoin Gold allows countless new people to take part in the mining process, being a more democratic mining infrastructure. Besides, a SIGHASH_FORK_ID

names	BTC	Dash	ETH	XMR	LTC	BTG	MKR	XRP	Gold	FTSE	CAC40	FTSEMIB	DAX30	Nikkei	SP/ TSX	S&P500	From
BTC	0.289	0.104	0.216	0.124	0.016	0.021	0.018	0.022	0.020	0.023	0.022	0.019	0.022	0.029	0.028	0.027	0.711
Dash	0.132	0.258	0.144	0.153	0.017	0.028	0.025	0.027	0.027	0.022	0.023	0.021	0.032	0.038	0.028	0.026	0.742
ETH	0.224	0.106	0.293	0.105	0.019	0.014	0.022	0.023	0.022	0.025	0.021	0.019	0.023	0.028	0.029	0.025	0.707
XMR	0.132	0.151	0.117	0.266	0.022	0.023	0.024	0.030	0.027	0.029	0.028	0.028	0.030	0.035	0.029	0.029	0.734
LTC	0.032	0.027	0.036	0.030	0.433	0.024	0.027	0.042	0.032	0.047	0.056	0.055	0.056	0.036	0.045	0.023	0.567
BTG	0.045	0.070	0.047	0.035	0.036	0.418	0.043	0.030	0.024	0.037	0.039	0.045	0.040	0.036	0.035	0.019	0.582
MKR	0.046	0.085	0.056	0.036	0.026	0.154	0.254	0.028	0.029	0.035	0.043	0.054	0.043	0.051	0.042	0.021	0.746
XRP	0.058	0.037	0.062	0.046	0.044	0.048	0.045	0.388	0.035	0.033	0.034	0.039	0.031	0.029	0.040	0.032	0.612
Gold	0.050	0.039	0.052	0.049	0.028	0.023	0.026	0.026	0.414	0.040	0.042	0.042	0.043	0.042	0.046	0.038	0.586
FTSE	0.037	0.023	0.038	0.030	0.016	0.017	0.016	0.015	0.016	0.220	0.151	0.113	0.131	0.047	0.113	0.019	0.780
CAC40	0.038	0.024	0.037	0.027	0.016	0.013	0.013	0.017	0.013	0.133	0.183	0.149	0.160	0.041	0.119	0.018	0.817
FTSEMIB	0.042	0.026	0.040	0.032	0.018	0.019	0.013	0.016	0.019	0.104	0.156	0.204	0.148	0.031	0.111	0.020	0.796
DAX30	0.037	0.025	0.035	0.026	0.018	0.013	0.013	0.014	0.015	0.123	0.169	0.147	0.193	0.041	0.112	0.019	0.807
NIKKEI	0.053	0.028	0.042	0.041	0.022	0.020	0.021	0.028	0.016	0.094	0.112	0.097	0.114	0.207	0.086	0.019	0.793
SP/TSX	0.044	0.027	0.044	0.030	0.014	0.015	0.019	0.020	0.016	0.109	0.130	0.119	0.118	0.039	0.231	0.024	0.769
S&P500	0.045	0.027	0.043	0.034	0.017	0.017	0.020	0.018	0.022	0.113	0.129	0.119	0.117	0.043	0.144	0.092	0.908
To	1.014	0.799	1.009	0.797	0.328	0.450	0.345	0.356	0.332	0.967	1.157	1.064	1.108	0.567	1.008	0.359	0.729
Net	0.303	0.057	0.302	0.063	-0.239	-0.132	-0.401	-0.256	-0.253	0.186	0.340	0.268	0.300	-0.226	0.239	-0.550	

Cryptocurrencies,
gold and stock
markets

Table 4.
Dynamic
connectedness table for
full sample

Figure 1.
Total dynamic
connectedness

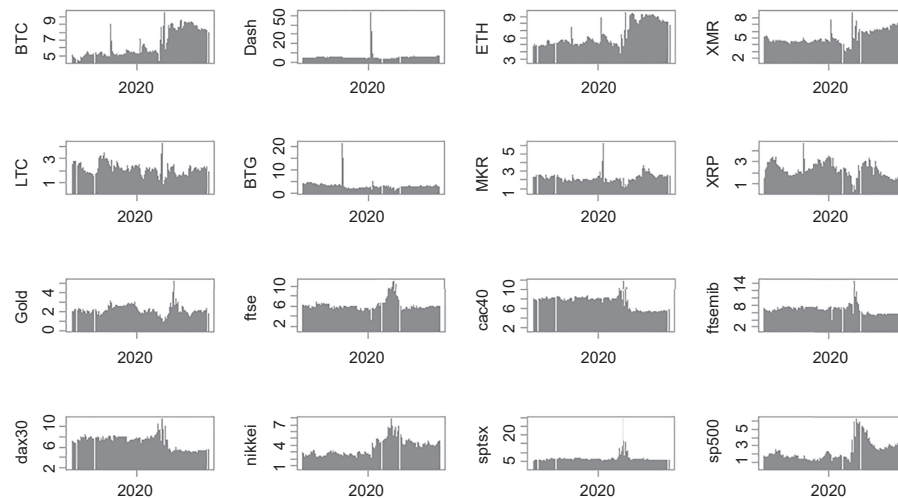
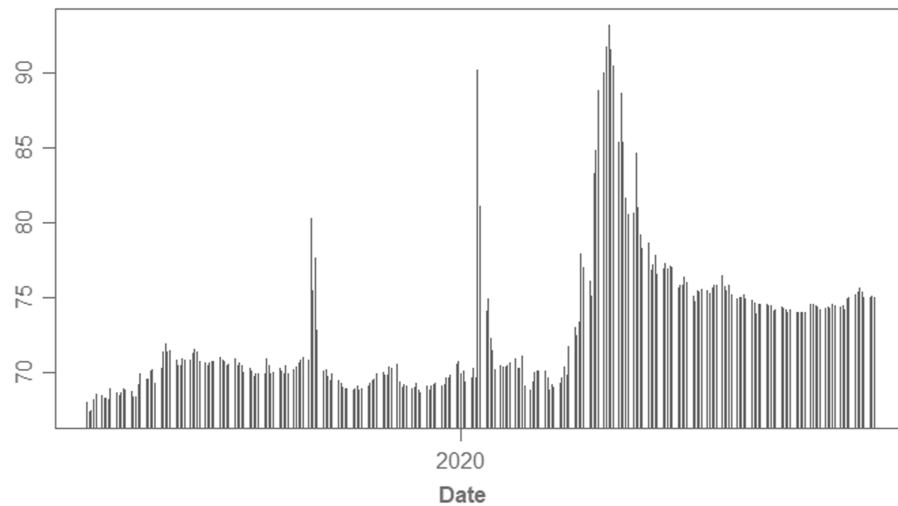


Figure 2.
The total directional
connectedness -TO-

replay protection mechanism is implemented. So, every Bitcoin transaction is invalid in BTG blockchain. This explains that the Bitcoin Gold is a safe haven for other cryptocurrencies, in the COVID-19 crisis.

The from-connectedness even becomes lesser than before crisis period. We also notice substantial differences between Figures 2 and 3 which can be explained by the “net-connectedness”. Note that the difference between to-connectedness and from-connectedness is equal to net-connectedness. The volatile fluctuation shows that cryptocurrencies influence each other and the effect is unstable, except for the Bitcoin Gold.

We now focus on the net total directional volatility connectedness, where a clear disparity of the net-connectedness is shown in Figure 4. Moreover, it should be noticed that among the cryptocurrencies, Bitcoin has always been the most important net transmitter of

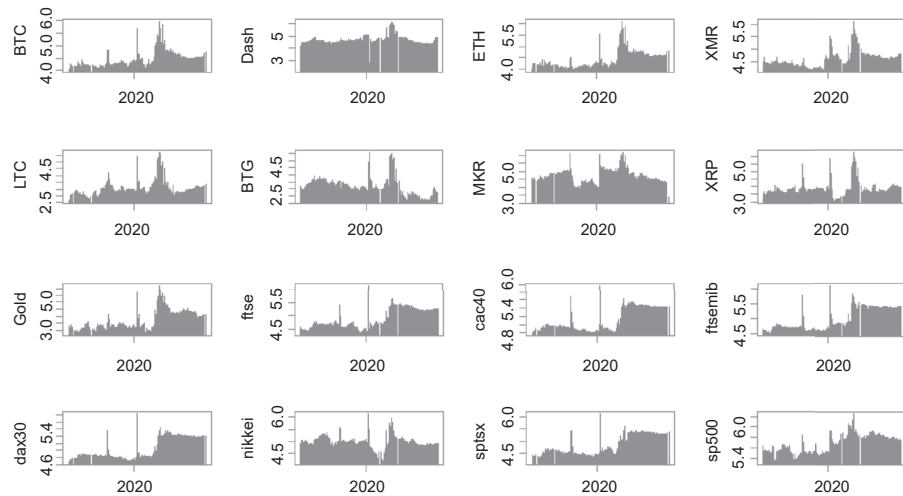


Figure 3.
Total directional
connectedness – from

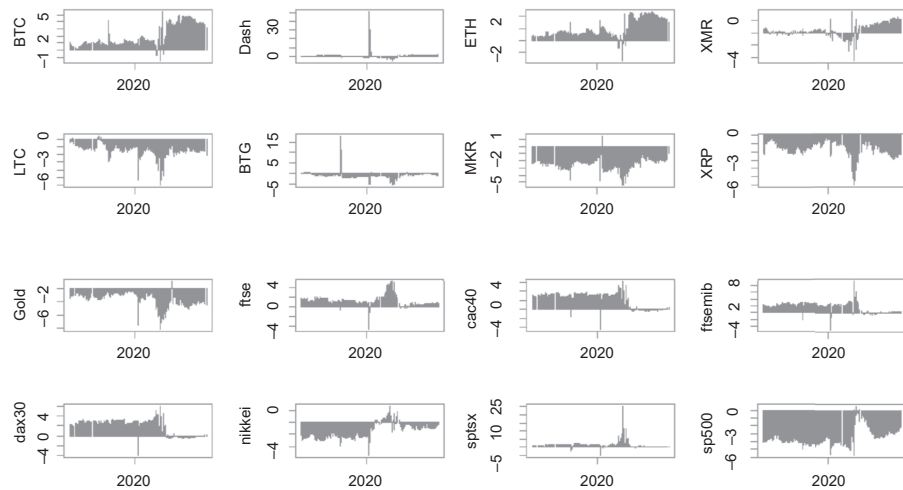


Figure 4.
Total directional net-
connectedness

volatility connectedness or spillovers during crisis periods followed by Ethereum and Monero. Our result was confirmed by Jeribi and Ghorbel (2021), which indicates that the fluctuation of Bitcoin transfers significant risk to the others cryptocurrencies but the extent of this transfer is greater after the shock due to the COVID-19 crisis. We also noticed that Maker is the biggest net receiver of volatility from the global system followed by Ripple and Litecoin and that the net connectedness reception is extended during the crisis period. Economically, we can conclude that Maker, Ripple and Litecoin are significantly affected by shocks and thus are more sensitive to implied volatility fluctuations while Bitcoin, Ethereum and Monero are more powerful currencies. Furthermore, we clearly observed that the net dynamic volatility connectedness for Bitcoin Gold and Dash is barely significant, meaning that there is a sort of compensation between the net-connectedness and the from-connectedness. Bitcoin Gold is almost stable with respect to the implied volatility

fluctuation in the global system. Therefore, it is a safe haven for other cryptocurrencies and especially stock indices.

Turning to the stock indices, we noticed that the net transmission of FTSE, CAC40, FTSEMIB and DAX30 significantly drops after the crisis period besides, the net reception of the volatility connectedness or the spillover of Nikkei and SP 500 is marked by a significant decline. This indicates a significant change in their characteristics due to instability. As for Sp/TSX, while the net connectedness is not significant during almost the sample period, it is marked by a great shock during the crisis period as it became a net transmitter.

Finally, regarding gold, we noticed that it remains a net receiver with a significant increase in net reception during the crisis period. Overall, we can conclude that connectedness is shown to be conditional on the extent of economic and financial uncertainties marked by the propagation of the corona virus. This confirms the results of the Jeribi and Fakhfekh (2020) and Jeribi *et al.* (2020). Such comparative studies would improve our understanding of the portfolio strategies for international investors among different assets, especially during crisis period.

Next, we construct the directional connectedness network based on the net pairwise connectedness. Figure 5 displays the network plot of the full-sample static implied volatility connectedness of each cryptocurrency, stock index and gold. Each of them is set as a node and a directional edge from i to j exists only if the net pairwise connectedness from i to j is positive. Then, the nodes represent the stock index, gold and currency series included in our analysis. The dark color of each node indicates the degree of the total "Net" connectedness of

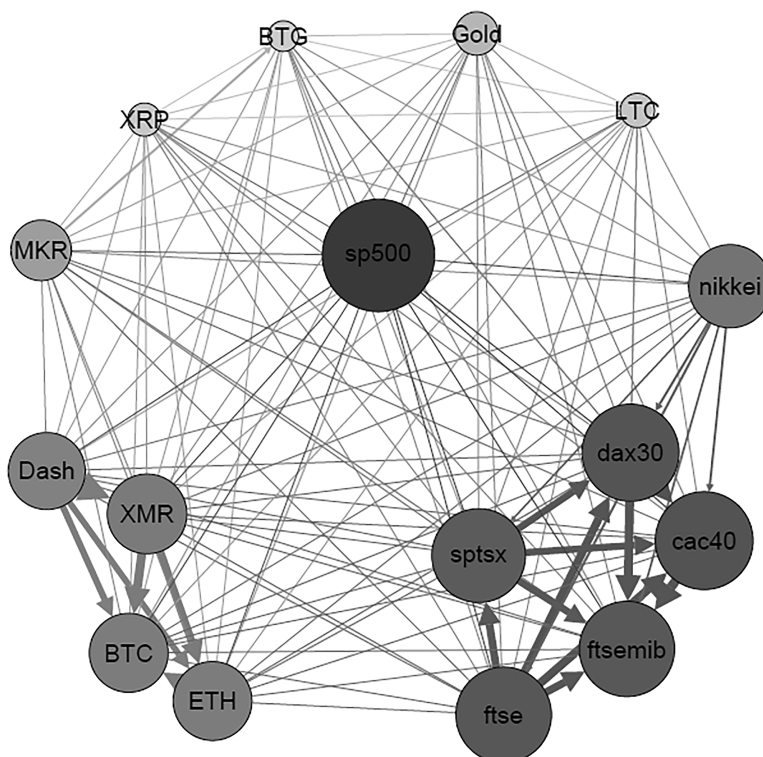


Figure 5.
Directional
connectedness
network (in)

the volatility indices, i.e. the net difference of “To all others” minus “From all others.” These would help us identify the quantum and directions of shocks. Using the node dark color and area, we attempted to convey full-scale information of the system-wise connectedness dynamics of the stock indices, gold and cryptocurrencies covered in this paper.

To simplify visualization and interpretation, Figure 5 is based on only the maximum net pairwise connectedness from all the other nodes to each node i . Subsequently, in Figure 5, each node is of degree 1, which reflects only the maximum information inflow from the other nodes. Similarly, in Figure 6, each node is of out-degree 1, which reflects only the maximum information outflow from each node to the other nodes.

In Figure 5, NIKKEI and S&P500 are the largest receivers among stocks from the system followed by the rest of stocks. We also noticed that the distances between CAC40, DAX 30, FTSE, FTSEMIB and SP/TSX are very short. This reflects the high pairwise correlation among this set of stock indices. Furthermore, the disposition of NIKKEI and S&P500 in the figure reflects their low correlation with others. The same conclusions could be drawn from the thickness of the arrows.

Besides, amid Cryptocurrencies, we figure out that DASH, MONERO, ETHEREUM and BITCOIN are not only the greatest receivers but also closely related to others in terms of volatility connectedness. They are followed by MAKER, which is not closely related to other studied cryptocurrencies, reflecting the low pairwise connectedness with others. More interestingly, we noticed that Ripple, Bitcoin Gold and Litecoin are the least receivers and disposed away from the other cryptocurrencies. Therefore, we can detect their potential status as hedge cryptocurrencies against systemic risk.

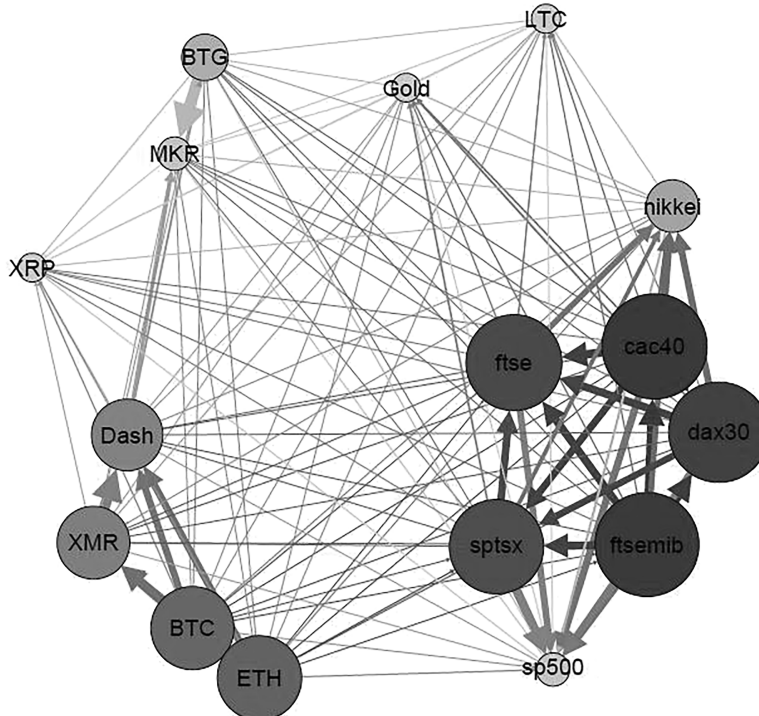


Figure 6.
Directional
connectedness
network (out)

In fact, Figure 6 displays the maximum information outflow from each node to the other nodes. Moreover, through the disposition of each node, its darkness and the thickness of arrows, we noticed that concerning the stock indices; CAC40, DAX30, FTSE, FTSEMIB and SP/TSX are the greatest transmitters as they are the greatest receivers. They are also highly correlated since they are closely disposed and the linking arrows are thick. We remarkably noticed that NIKKEI and S&P500 are the lowest transmitters among others; besides, they are graphically disposed far from the mentioned group of correlated indices. We can conclude that they are not significantly connected to the other indices. Turning to cryptocurrencies, we figure out that Ethereum and Bitcoin are the greatest transmitters followed by Monero and Dash as they significantly transmit volatility to Monero and Dash. On the other hand, Bitcoin Gold, Ripple, Maker and Litecoin are the lowest transmitters since the nodes are clearer and smaller, indicating their low influence of volatility. Besides, they are graphically dispersed and the arrows are not thick, reflecting the low pairwise connectedness between them. Finally, we can easily notice that gold is a low transmitter as it is a low receiver. Besides, the gold node is graphically disposed away from others with thin arrows meaning that it is not significantly connected with other cryptocurrencies and stock indices which indicating it is a safe haven during the pandemic COVID-19.

5. Conclusion

This study investigates the connectedness between cryptocurrencies, gold and G7 stock indices and taking into account the effect of the COVID-19 crisis.

According to the pairwise connectedness analysis, Litecoin is a diversifier in a cryptos' portfolio. When we consider gold in portfolio assets, it becomes visible that gold is a diversifier for cryptos. Besides, for a crypto and stocks portfolio, we find that the least transmitters of volatility are Dash, as crypto-currency and DAX 30, as a stock index. At last and not least, CAC 40 is a diversifier in a portfolio of stocks and gold. Finally, for a stock index portfolio, FTSEMIB is the least receiver and so, it is a diversifier in this case. It is worth noting that in general, cryptocurrencies are diversifiers for a stock index portfolio and allow volatility reduction especially in crisis period.

On the other hand, dynamic connectedness results do not significantly differ from static connectedness, we just mention that Bitcoin Gold becomes a net receiver. The scope of connectedness is maintained after the shock for most of cryptocurrencies, except for Dash and Bitcoin Gold, which join previous level. For the stocks, the high spillover is detected for all the studied stocks but loses scope after the crisis period and almost returns to normal values, except for Nikkei and SP&500. However, Bitcoin has always been the greatest net transmitter of volatility connectedness or spillovers for cryptocurrencies Gold and G7 stock indices, during the COVID-19 crisis. On the other hand, Maker is the greatest net-receiver of volatility from the global system. As for gold, we noticed that it remains a net receiver with a significant increase in the net reception during the crisis period.

Overall, we can conclude that connectedness is shown to be conditional on the extent of economic and financial uncertainties marked by the propagation of the corona virus.

NIKKEI and S&P500 are the greatest receivers among stocks from the system followed by the rest of stocks, including CAC40, DAX30, FTSE, FTSEMIB and SP/TSX, which are the greatest transmitters as they are the greatest receivers. Therefore, this confirms the contagion of the COVID-19 crisis between G7 stock markets. In contrary, NIKKEI and S&P500 are the lowest transmitters. As a consequence, the American and Japanese stock markets are more attractive to investors since they are less exposed to the shocks of other markets. However, Bitcoin Gold and Litecoin are the least receivers from the other cryptocurrencies, leading to the conclusion that they can be diversifiers during crisis. As for

Ethereum and Bitcoin, they are the greatest transmitters from other cryptocurrencies, which confirm their weight and influence on the crypto-currency market.

On the other hand, gold is a low transmitter and receiver, which confirms that it is a safe haven. Therefore, the investors can diversify their portfolios in order to reduce their risks, by adding Bitcoin Gold and Litecoin, when investing in Gold and G7 stock markets.

Notes

1. <https://www.tellerreport.com>
2. <https://www.reuters.com>
3. <https://www.barrons.com>
4. <https://kyodonews.net>
5. <https://www.businessinsider.fr>
6. <https://cryptonaute.fr0>
7. Our results are quite robust to 100 and 150 rolling-window size as well. The results are available from the corresponding author upon request.

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The importance of social comparison in perceived justice during the service recovery process

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Abstract

Purpose – This study aims to analyse how consumers' perceptions of justice in a service recovery scenario vary, not only due to the company's actions but also due to the comparisons they make with the experiences of other consumers.

Design/methodology/approach – Based on justice theory, social comparison theory and referent cognitions theory, this study describes an eight-scenario experiment with better or worse interactional, procedural and distributive justice (better/worse interactional justice given to other consumers) \times 2 (better/worse procedural justice given to other consumers) \times 2 (better/worse distributive justice given to other consumers).

Findings – First, consumers' perceptions of interactional, procedural and distributive justice vary based on the comparisons they draw with other consumers' experiences. Second, the results confirmed that interactional justice has a moderating effect on procedural justice, whereas procedural justice does not significantly moderate distributive justice.

Originality/value – First, based on justice theory, social comparison theory and referent cognitions theory, we focus on the influence of the treatment received by other consumers on the consumer's perceived justice in the same service recovery situation. Second, it is proposed that the three justice dimensions follow a defined sequence through the service recovery phases. Third, to the best of the authors' knowledge, this study is the first to propose a multistage model in which some justice dimensions influence other justice dimensions.

Keywords Service failure, Service recovery, Justice theory, Consumer comparison, Social comparison theory, Referent cognitions theory, Airline companies

Paper type Research paper

Introduction

The fierce competition in the service sector and high rates of customer loss after service failures have increased the attention paid to service recovery as a means of retaining customers (La and



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Choi, 2019; Sánchez-García and Curras-Perez, 2020). Service failure arises in situations where businesses do not meet their customers' expectations (Simões-Coelho *et al.*, 2023). This will happen, sooner or later, often with very negative results (La and Choi, 2019). When a service failure occurs, the probability of losing the customer is high, and the reputation of the company may be seriously affected (Grégoire *et al.*, 2018). Specifically, 86% of consumers leave brands they were once loyal to after only two to three bad customer service experiences, 63% leave because of poor customer experience and 49% stated that, during the previous 12 months, they had left a company they had been loyal to for that reason (Emplifi, 2022). The cost of poor customer service ranges from \$75 billion to \$1.6 trillion per year (McCain, 2023). To combat this situation companies have developed service recovery strategies to restore customer satisfaction, mainly through process-related treatments (e.g. explanations) and monetary compensation (Ahmad *et al.*, 2023). Previous studies have shown that, when customers are compensated for service failures by receiving service better than they expected, they usually rate their satisfaction with companies and their services higher than prior to the failure (Cheng *et al.*, 2015). One of the most common service failure research perspectives is the evaluation of customers' responses to failures based on their perceptions of the justice they receive (La and Choi, 2019). Justice theory proposes that customers' satisfaction increases when they experience "fair" recovery (Grégoire *et al.*, 2018). However, some studies have suggested that customers can affect one another in a service recovery scenario (Albrecht *et al.*, 2019), because they are social comparers (Ludwig *et al.*, 2017). Social comparison research has aroused special interest in the social sciences since Sherif (1936) showed that two people facing the same situation develop a point of reference through a process of mutual social influence (Buunk and Gibbons, 2007). However, relatively little research has examined how consumers perceive the outcome of system recovery processes when they compare their experiences with those of other consumers (Bonifield and Cole, 2008; Chen *et al.*, 2023).

This study makes three contributions. Based on justice theory (Rawls, 1971), social comparison theory (Festinger, 1954) and referent cognitions theory (Folger, 1986), we examine the influence of the treatment received by other consumers on the consumer's perceived justice in the same service recovery situation. Second, it is proposed that the three justice dimensions follow a defined sequence during the service recovery phases (Murphy *et al.*, 2015). Third, to the best of the authors' knowledge, this study is the first to propose a multistage model in which some justice dimensions influence other justice dimensions.

Theoretical background and hypotheses development

Perceived justice

Kelley and Davis (1994) defined service recovery as the process by which firms attempt to rectify a service delivery failure. Service recovery includes all the activities/responses that service providers perform/make to repair losses experienced by customers (Grönroos, 1998). Service research has adopted justice theory as the dominant theoretical framework (Huang, 2011). Justice has been said to be related to evaluations, based on moral criteria, of how the individual is treated by others (persons and entities) (Furby, 1986). Tax *et al.* (1998) proposed that perceived justice is a complex, tri-dimensional concept (interactional, procedural and distributive justice). Interactional justice relates to how the consumer is treated during a complaints process and includes elements such as the courtesy and kindness exhibited by company staff, empathy perceived, efforts made to resolve and willingness to provide reasons for the failure, for example, by an airline when a flight is cancelled (Schoefer and Ennew, 2005). Procedural justice, as the term suggests, relates to the perceived fairness of the processes applied by the company to recover the failure. It includes aspects such as delays in the processing of the complaint, response time to the complaint and the company's flexibility in adapting to the consumer's needs (Blodgett *et al.*, 1997). Distributive justice is the degree to

which consumers feel they have been treated fairly, specifically, what economic compensation the company offers for the failure. Distributive justice may result in refunds, discounts or other forms of compensation (Maxham and Netemeyer, 2002).

The previous literature has found that perceived justice has a critical influence on the development of consumers' evaluative judgements (Schoefer and Ennew, 2005), influences behavioural reactions (Colquitt *et al.*, 2006), creates trust and evokes positive emotions (La and Choi, 2012) and satisfaction (Sánchez-García and Curras-Perez, 2020). Specifically, consumers' satisfaction with recovery service is significantly affected by procedural and interactional justice (Mohd-Any *et al.*, 2019). Mathew *et al.* (2020) showed that perceived justice had a significant moderating effect on the relationship between e-service recovery quality and e-service recovery satisfaction. In a novel approach we suggest that the three perceived justice dimensions unfold in a particular order. Our sequential model is consistent with suggestions made by other authors in different research fields, such as organisational management, who have proposed that interactional justice is a precursor of procedural and distributive justice (Cohen-Charash and Spector, 2001; Tran *et al.*, 2021). In the present study, it is expected that individuals affected by a service failure will primarily attribute any associated (in)justice to the person in the company responsible for the service at that moment. In fact, previous literature has affirmed that interactional justice relates to how individuals treat and communicate with, each other in the place where the problem occurred (Bies and Moag, 1986). Thus, the recovery process starts with the consumer's first contact with the company's customer service department. This initial contact, which is directly connected to the interpersonal treatment people receive during recovery procedures, is encompassed within the interactional dimension. Second, social psychology research has gradually shifted its emphasis from focussing solely on the outcomes of reward allocation (distributive justice) to a focus on an earlier stage in the process, that is, the company's flexibility in adapting to consumers' needs (Blodgett *et al.*, 1997; Wood *et al.*, 2020), which has been described as an important dimension of their perceptions of justice (Thibaut and Walker, 1975). This process, related to the procedure through which the complaint is handled, is likely to unfold after the consumer has filed the complaint and before the company has resolved it. Finally, the consumer focuses on compensation, that is, the distributive justice dimension. As previously noted, distributive justice relates to the consumer's perception of justice in the outcome of the process, so it seems logical to place it at the end of the sequence.

In addition, like many of the personal evaluations that humans make, perceived justice can be strongly influenced by the individual's way of thinking, perceptions and personal experiences (LaFave, 2008). In this regard, humans assess the experiences of their peers to evaluate their own experiences. Regardless of whether consumers have had much prior experience of any particular event/incident, the experiences of their peers will help them understand what has happened. However, little research has delved into the influence of other consumers on the consumer's experience of the same system failure (Albrecht *et al.*, 2019).

Social comparisons

Previous studies have shown that the presence of other consumers affects the individual's behaviours (Albrecht *et al.*, 2019). For example, Viglia and Abrate (2014) found that consumers are more influenced by social comparisons, for instance, price information given to them by friends, than they are when the information source is anonymous; in the latter case they are likely to lower their reference price (to be closer to average past prices). Social comparison theory argues that individuals evaluate their opinions and abilities by comparing them with those of other, similar individuals (Festinger, 1954). In the justice context, Greenberg (1982) argued that people perceive injustice when they receive dissimilar treatment, procedures or economic benefits to those received by others. Thus, individuals use social comparisons to associate with others, learn from others, self-assess against others (Taylor and Lobel, 1989) and

to make sense of their own outcomes (Moore, 2007). This process, as it helps to reduce uncertainty, is a fundamental aspect of human experience (Suls and Wheeler, 2000) and has been explored in service recovery research. Indeed, social comparisons are an inevitable part of social intercourse (Brown *et al.*, 2007) because, when people interact with others, consciously or unconsciously they compare themselves with these other people (Wheeler and Miyake, 1992). Steinhoff and Palmatier (2016) confirmed that comparing oneself to someone “worse” produces positive feelings and comparing oneself with someone “better” produces negative feelings, for example, in the context of hotels and flying.

Referent cognitions theory (Folger, 1986) recognises the role of comparisons in perceived justice and proposes that procedures that affect oneself and others, are taken into account. Comparisons are important for establishing justice perceptions because they allow consumers to evaluate whether they received what they deserved (Chen *et al.*, 2023). Furthermore, in the consumer’s evaluation of whether a deal is fair, knowing what others obtained is often more important than the procedural justice (s)he himself/herself received (Bonifield and Cole, 2008). Consumers use this information to assess justice and satisfaction (Chen *et al.*, 2023). Therefore, we propose the following hypotheses:

- H1. The consumer’s perception of the interactional justice received by other consumers inversely influences his/her perceptions of the interactional justice s(he) has received.
- H2. The consumer’s perception of the procedural justice received by other consumers inversely influences his/her perceptions of the procedural justice s(he) has received.
- H3. The consumer’s perception of the distributive justice received by other consumers inversely influences his/her perceptions of the distributive justice s(he) has received.

Many service encounters occur on what is known as the organisational frontline. Unlike other frontline interactions (e.g. in the sales/purchase process, which may develop over many interactions), on the service failure recovery frontline employees play a critical role in the provision of quality service (Carlzon, 1987; Lindsey-Hall *et al.*, 2023). The first few moments of the interaction are very critical and have a great impact on how the customer perceives the whole service (Lin *et al.*, 2016). Previous studies have concluded that, during customer-company face-to-face interactions, the customer’s initial impressions influence subsequent interactions and can, ultimately, influence customer outcomes (Anwar, 2023). Thus, on the basis that justice perceptions are based on the consumer’s perceptions of the gains and losses (s)he experiences in a relationship with a provider (Kwon and Jang, 2012) and that equity theory (Adams, 1965) proposes that his/her perceptions during a recovery process take into account the company’s previous efforts to recover the situation, it is proposed that the consumer’s perceptions of the justice (s)he receives may be formed by his/her perceptions of the justice (s)he received in previous justice dimensions. Therefore, the following hypotheses are proposed:

- H4. The consumer’s perceptions of the interactional justice received by other consumers moderates the relationship between his/her perceptions of the procedural justice given to those consumers and his/her perceptions of the procedural justice (s)he has received, such that:

The consumer’s perceptions of the procedural justice received by other consumers will have a greater influence on his/her perceptions of the procedural justice s(he) has received when the interactional justice received by others is worse (H4a) than when it is better (H4b).

- H5. The consumer’s perceptions of the interactional justice received by other consumers moderates the relationship between his/her perceptions of the distributive justice given to those consumers and his/her perceptions of the distributive justice (s)he has received, such that:

The consumer's perception of the distributive justice received by other consumers will have a greater influence on his/her perceptions of the distributive justice s(he) has received when the interactional justice received by others is worse (H5a) than when it is better (H5b).

Finally, companies overemphasise distributive justice (the customer received the promised result) whilst neglecting procedural justice (Michel *et al.*, 2009). Thus, companies tend to assume that the most important aspect of service failure recovery is monetary compensation, a form of distributive justice. However, the majority of the reasons given by consumers for their low levels of satisfaction after a service failure relate to procedural justice, overly complicated toll-free numbers, user-unfriendly websites and outsourced customer care contact centres (NCRS, 2020). This leads us to suggest that consumers' perceptions of the procedural justice they receive may influence their subsequent justice perceptions.

H6. The consumer's perceptions of the procedural justice received by other consumers moderates the relationship between his/her perceptions of the distributive justice given to those consumers and his/her perceptions of the distributive justice (s)he has received, such that:

The consumer's perceptions of the distributive justice received by other consumers will have a greater influence on his/her perceptions of the distributive justice s(he) has received when the procedural justice received by others is worse (H6a) than when it is better (H6b).

Figure 1 depicts the proposed conceptual model.

Research methodology

To guarantee the validity of the data and the representativeness of the sample, the specialised market research company Netquest was hired. The company, at the end of 2019, used a consumer panel to randomly assign the participants to the different scenarios. The participants were remunerated. The vast majority of the panellists had taken part in previous studies and their prior participation had been considered satisfactory by the company.

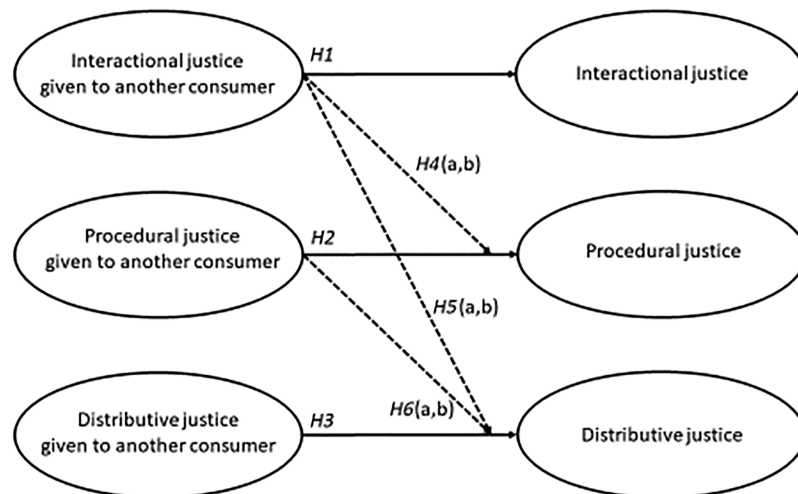


Figure 1.
The proposed
conceptual model

Source(s): Authors' elaboration

Pre-test study

Following Harris *et al.* (2006), a pre-test was conducted to assess the realism of the experimental setting and scenarios. Some 51 respondents participated in the pre-test, 56% women, 44% men, from 18 to 62 years old. Following receipt of the experimental instructions, the participants were randomly assigned to one of the eight experimental conditions. Subsequently, the participants were thanked, debriefed and asked to answer a short survey. We measured the realism of the scenarios (see Appendix 2) through four items, with 7-point bipolar scales, adapted from Collie *et al.* (2002). An example item is: "I believe that situations like this happen in real life" ($\alpha = 0.73^{***}$). The participants reported that they perceived the scenarios as being realistic (Mean = 5.93, Standard Deviation = 1.05).

Main study

The airline sector has been growing. In 2022, it gained 64% in turnover over the previous year and is forecast to grow by 28.3% in 2023 (Statista, 2023). The experiment examined a recovery process after a service failure, that is, a baggage loss incident. This scenario was selected because baggage loss is one of the main service failures in the sector (Mohd-Any *et al.*, 2019).

To ensure the subjects could identify with the proposed scenario, a condition of participation was that they must have taken at least one flight in the previous six months. To test the research hypotheses, Netquest recruited 259 Spain-based panellists. Table 1 shows the socio-demographic characteristics of the sample.

The participants were first told that the questionnaire was an academic-focused opinion survey about service recovery, and they were then asked to answer questions about the research framework's variables. First, the survey described a baggage loss incident. Thereafter, the participants were randomly assigned to a condition in a 2 (better/worse interactional justice given to other consumers) \times 2 (better/worse procedural justice given to other consumers) \times 2 (better/worse distributive justice given to other consumers) design. At least 30 participants were used for each condition. As Table 2 shows, the researchers were particularly interested in ensuring that the groups consisted of similar numbers.

Variable		<i>N</i>
Gender	Men	137
	Female	122
Marital status	Married/coupled	148
	Single	105
	Divorced/separated	6
Occupation	Housewife	23
	Unemployed	15
	Employed	113
	Student	106
	Retired	2
Studies	Primary	21
	High School	58
	College	180
Age	$\geq 18, < 22$	59
	$\geq 22, < 30$	63
	$\geq 30, < 49$	66
	≤ 49	71

Source(s): Authors' elaboration

Table 1.
Sample demographic
characteristics

The experiment described the following situation: a passenger arrives by plane at an airport, but his/her check-in luggage did not appear on the carousel. After submitting his/her complaint, (s)he sees that another passenger on the same flight has had the same problem and is also making a complaint. At that point the participant is randomly assigned to one of the eight possible scenarios (interpersonal, procedural and distributive justice), outlined in Appendix 1. As the central proposition of social comparison theory (Festinger, 1954) is the “similarity hypothesis”, which argues that individuals tend to compare themselves with similar people in similar situations, the traveller/participant then had to compare himself/herself with someone who was travelling on the same flight, has the same problem and is even staying in the same hotel. The participants were asked to rate, on a scale of 1–7, their perceptions of interpersonal, procedural and distributive justice associated with the way the airline resolved the failure. Finally, they were asked to provide socio-demographic information.

Measurement

The measurement scales for the questionnaire were adopted from previous literature (see Appendix 2). We measured interactional justice using four items on 7-point bipolar scales, adapted from Karatepe (2006), for example, “The hotel employee was courteous” ($\alpha = 0.89$). Procedural justice was measured using four items on 7-point bipolar scales, based on DeWitt *et al.* (2008), for example, “The policies and procedures the firm had in place were adequate for addressing my concerns” ($\alpha = 0.91$). Distributive justice was measured using three items on 7-point bipolar scales, also adapted from DeWitt *et al.* (2008), for example, “The outcome I received was fair” ($\alpha = 0.92$).

Convergent validity was verified as the factor loading of each indicator was found to be above 0.5 and significant at the 0.01 level (Steenkamp and Van Trijp, 1991), and the statistical values of the AVEs were greater than 0.5 (Fornell and Larcker, 1981). Similarly, composite reliability exceeded the minimum recommended value of 0.65 (Bagozzi and Yi, 1988). Finally, to determine discriminant validity, we compared the square roots of the AVEs (the values on the diagonal, in bold) with the inter-construct correlations (values below the diagonal); to ensure discriminant validity, the on-diagonal values should be higher (Fornell and Larcker, 1981). The results from these analyses were satisfactory, as shown in Table 3.

Results

To test the effects proposed in the hypotheses we conducted three 2×2 analyses of variance (ANOVA), using IBM SPSS Statistics v.26 software. The results showed that the interactional justice given to other consumers during the recovery process inversely influenced the participants’ perceptions of interactional justice they received ($F(1, 257) = 6.59, p = < 0.05$),

Interpersonal	Procedural	Distributive	N
Worse	Worse	Worse	31
Worse	Worse	Better	32
Worse	Better	Worse	36
Worse	Better	Better	35
Better	Worse	Worse	32
Better	Worse	Better	32
Better	Better	Worse	31
Better	Better	Better	30

Table 2.
Sample distribution (by
scenarios)

Source(s): Authors’ elaboration

supporting H1. More specifically, the results showed that consumers perceived higher levels of interactional justice if others had been treated worse ($M_{\text{Other'sWorseInteractionalJustice}} = 4.36$; $M_{\text{Other'sBetterInteractionalJustice}} = 3.93$). Similarly, the procedural justice given to other consumers inversely influenced the respondents' procedural justice perceptions ($F(1, 257) = 8.44, p < 0.01$), supporting H2. Again, the participants perceived higher levels of procedural justice if others had been treated worse ($M_{\text{Other'sWorseProceduralJustice}} = 3.43$; $M_{\text{Other'sBetterProceduralJustice}} = 2.94$). Finally, supporting H3, the distributive justice given to other consumers inversely influenced the participants' distributive justice perceptions ($F(1, 257) = 25.43, p < 0.01$). In line with the previous results, the participants perceived higher levels of distributive justice if others had been treated worse ($M_{\text{Other'sWorseDistributiveJustice}} = 3.50$; $M_{\text{Other'sDistributiveJustice}} = 2.58$). As Table 4 shows, we checked for the presence of heteroscedasticity. First, we performed Levene's test; this tests the null hypothesis that the error variance of the dependent variable is equal between groups. The results were not significant for the interactional justice and procedural justice variables, so it was concluded that the variance of the groups was equal, and thus, an analysis of variance (ANOVA) could be performed. As for the distributive justice variable, although a statistically significant p -value appeared in the analysis of variance, Levene's test showed that heteroscedasticity is present. To remedy this heteroscedasticity problem, Welch's test was applied; this test is more robust in these cases (Norusis, 2011). The levels of statistical significance observed for distributive justice using Welch's tests were less than 0.05, therefore, the means of all groups are equal, allowing an analysis of variance (ANOVA) to be performed.

The overall interaction effects show that consumers' perceptions of procedural justice vary when they believe that other consumers have received better, or worse, interpersonal justice (confirming H4), ($F(1, 255) = 11.01, p < 0.01$). Contrary to our expectations, when other consumers received worse interactional justice, the participants' procedural justice perceptions increased, but not significantly, supporting H4a ($M_{\text{Other'sWorseInteractional} - \text{Other'sWorseProceduralJustice}} = 3.18$; $M_{\text{Other'sWorseInteractional} - \text{Other'sBetterProceduralJustice}} = 3.22$; $t(132) = -0.169, p > 0.10$). On the other hand, supporting H4b, when other consumers received better interactional justice, the participants' procedural justice perceptions decreased ($M_{\text{Other'sBetterInteractional} - \text{Other'sWorseProceduralJustice}} = 3.67$; $M_{\text{Other'sBetterInteractional} - \text{Other'sBetterProceduralJustice}} = 2.60$; $t(123) = 4.48, p < 0.01$); see Figure 2.

With respect to H5, it was found that the moderating effects of the interactional justice received by other consumers on distributive justice perceptions was not significant ($F(1, 255) = 1.33, p > 0.10$). However, the results indicated that when other consumers received better interactional

	CR	AVE	Interactional justice	Procedural justice	Distributive justice
Interactional justice	0.908	0.713	<i>0.869</i>		
Procedural justice	0.903	0.702	0.440	<i>0.885</i>	
Distributive justice	0.925	0.804	0.262	0.475	<i>0.931</i>

Note(s): The diagonal elements (in italic) are the square roots of the AVEs (variance shared between the constructs and their measures). Off-diagonal elements are the inter-construct correlations

Source(s): Authors' elaboration

Table 3.
Composite reliability
and convergent and
discriminant validity

	Interactional justice	Procedural justice	Distributive justice
Levene's test	0.66	0.24	0.07
Welch's test	—	—	0.00

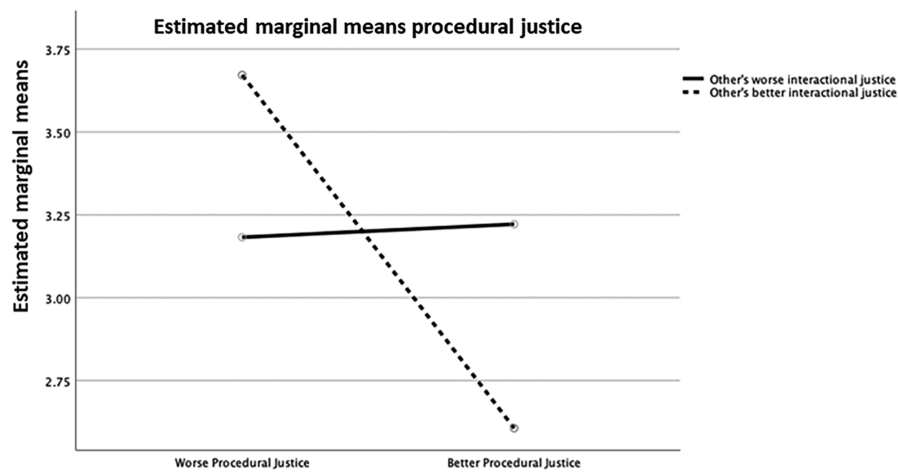
Source(s): Authors' elaboration

Table 4.
Homoscedasticity and
heteroscedasticity test

justice, the procedural justice perceived by the participants increased ($M_{\text{Other's Better Interactional Justice} - \text{Other's Worse Distributive Justice}} = 3.70$, $M_{\text{Other's Better Interactional Justice} - \text{Other's Better Distributive Justice}} = 2.56$; $t(123) = 4.19$, $p < 0.01$); ($M_{\text{Other's Worse Interactional Justice} - \text{Other's Worse Distributive Justice}} = 3.31$, $M_{\text{Other's Worse Interactional Justice} - \text{Other's Better Distributive Justice}} = 2.60$; $t(132) = 2.92$, $p < 0.05$); see Figure 3.

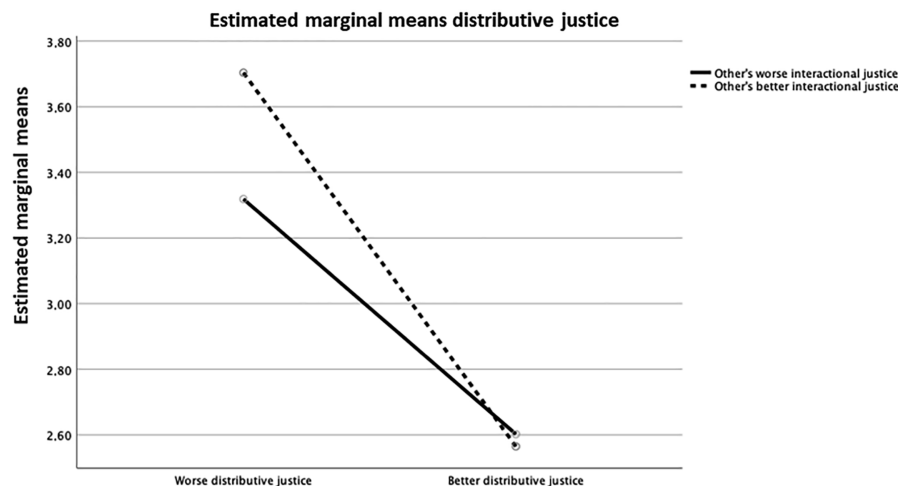
Similarly, it was shown, as proposed in H6, that the procedural justice received by other consumers moderated the participants' distributive justice perceptions, but the differences were not significant ($F(1, 255) = 0.17$, $p > 0.10$). ($M_{\text{Other's Worse Procedural Justice} - \text{Other's Worse Distributive Justice}} = 3.57$, $M_{\text{Other's Worse Procedural Justice} - \text{Other's Better Distributive Justice}} = 2.57$; $t(125) = 3.53$, $p < 0.01$). ($M_{\text{Other's Better Procedural Justice} - \text{Other's Worse Distributive Justice}} = 3.45$, $M_{\text{Other's Better Procedural Justice} - \text{Other's Better Distributive Justice}} = 2.60$; $t(130) = 3.60$, $p < 0.01$); see Figure 4.

Figure 2. Moderating effect of the interactional justice received by other consumers on the relationship between the consumer's perception of the procedural justice given to those consumers and the consumer's perception of the procedural justice (s)he has received



Source(s): Authors' elaboration

Figure 3. Moderating effect of the interactional justice received by other consumers on the relationship between the consumer's perception of the distributive justice given to those consumers and the consumer's perception of the distributive justice (s)he has received



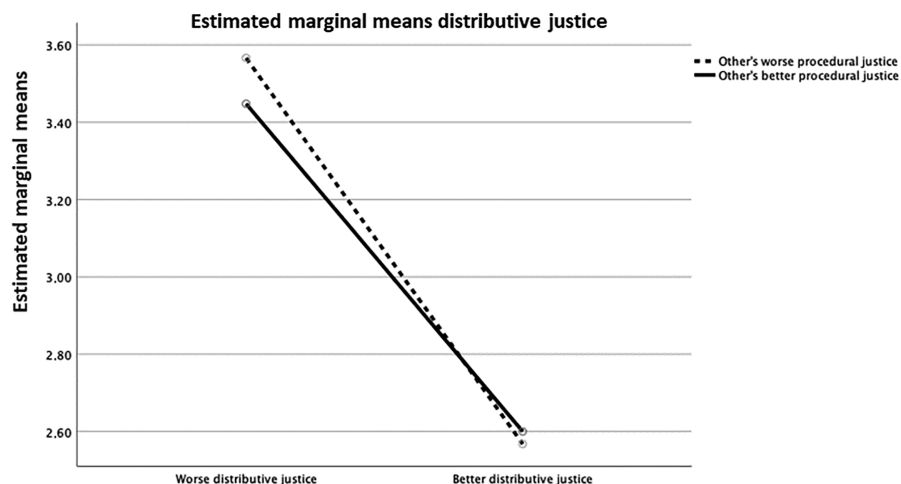
Source(s): Authors' elaboration

Discussion and implications

There is a need for an in-depth study of the different strategies companies employ for customer recovery after service failures, how they are implemented and how they are experienced by the consumer (Ahmad *et al.*, 2023; Chen *et al.*, 2023). In this sense, the theory of justice has been widely examined and has emerged as one of the main theoretical service recovery frameworks (Peinkofer *et al.*, 2022). The present study proposes that the three justice dimensions follow a particular sequence during the recovery process after a service failure. This research is based on the fact that humans are social beings by nature and assess the experiences of others in identical/similar situations to evaluate their own. Specifically, this study is based on the idea that, when faced with a service failure, the customer uses peer comparison to analyse and evaluate the treatment provided to him/her. Thus, when a customer observes that, for the same service failure, (s)he is being treated worse than other customers, (s)he may perceive that (s)he is being treated unfairly. Similarly, if the customer perceives that (s)he is being treated better than other customers, (s)he may perceive greater fairness in the service recovery process. The results showed that the interactional, procedural and distributive justice provided to other consumers during the recovery process inversely influenced the participants' perceptions of the interactional, procedural and distributive justice they received. Interestingly, the results confirmed that consumers perceive higher levels of justice when they believe that others have been treated worse than they have and, conversely, they perceive lower levels of justice when they believe that others have been treated better. Regarding moderation effects, the results suggest that the interactional justice given to one consumer influences other consumers' perceptions of procedural justice. However, the results did not show that interactional justice significantly influenced distributive justice, or that procedural justice influenced distributive justice.

Theoretical implications

Taking as bases social comparison theory (Festinger, 1954) and referent cognitions theory (Folger, 1986), this study analyses how the treatment given to some consumers during service recovery incidents influences other consumers' perceptions of justice. Social influence has been widely examined in social psychology (Gerber *et al.*, 2018); however, few studies has



Source(s): Authors' elaboration

Figure 4. Moderating effect of the procedural justice received by other consumers on the relationship between the consumer's perception of the distributive justice given to those consumers and the consumer's perception of the distributive justice (s)he has received

analysed that influence in a service recovery context (Bonifield and Cole, 2008; Ludwig *et al.*, 2017). Previous studies have focused on spontaneous and relatively automatic comparisons; for example, the social comparisons that some consumers might draw based on the information posted on other consumers' Facebook pages (Morry *et al.*, 2018). In contrast, our research is based on the social comparisons that some consumers may draw based on actions taken by companies, that is, we examine whether how companies behave towards some consumers is used by other consumers as material through which to make comparisons.

First, in line with Ludwig *et al.* (2017), this study demonstrated that, after a service failure, consumers' perceptions of the justice they receive varies based on how the company acts towards other consumers. Specifically, consumers perceive higher levels of justice when they believe that other consumers have been treated worse than them and, conversely, they perceive lower levels of justice when they believe that other consumers have been treated better. These findings confirm the importance of social comparison in service recovery (Bonifield and Cole, 2008) and are consistent with the results of previous studies that found that comparisons with "worse" individuals evoke positive feelings and with "better" individuals evoke negative feelings (Steinhoff and Palmatier, 2016).

Second, the present study proposes that perceived justice is a multistage model in which one justice type influences others. Taking a novel approach, this study posits that the three justice dimensions follow a specific sequence, that is, first the interactional, next the procedural and, finally, the distributive. The results suggest that the interactional justice given to one consumer influences other consumers' perceptions of procedural justice. This conclusion is consistent with previous research that has indicated that, if customers attribute employees' behaviours to organisations, interactional justice might influence procedural justice evaluations (Tyler and Bies, 1990). Therefore, in line with Anwar (2023), it is proposed that, during the initial stage of the recovery process, how a company treats some consumers affects other consumers' perceptions of procedural justice. As the results show, the procedural and distributive justice mean values were low. This could be because these are the most difficult justice dimensions to address (La and Choi, 2019). Consumers have their own vision of how complaints should be handled and are never fully satisfied with companies' protocols; similarly, they are rarely satisfied with the compensation they are offered and may believe that they deserved more. The results did not show that interactional justice significantly influenced distributive justice, or that procedural justice influenced distributive justice. These results are in line with previous research that suggested that the compensation obtained after a service failure is the most important issue in service recovery (Ahmad *et al.*, 2023). Thus, the compensation obtained by consumers seems to be decisive in their perceptions of justice in the service recovery process. Consistent with Ahmad *et al.* (2023), customers are more satisfied with the recovery process if they perceive that distributive recovery is fair; thus, they should be compensated fairly, or at least compensated in a way that will cover their losses.

Managerial implications

Identifying the main factors that lead consumers to abandon or switch service providers can help companies design more effective strategies to prevent them from leaving and to win back those who have already left (Anwar, 2023; Sánchez-García and Curras-Perez, 2020). Brun *et al.* (2017) emphasised that, following service failures, providers should bear in mind that the recovery process must resolve the important issues as quickly and as efficiently as possible. Managers must understand that the treatment given to some consumers during service recovery influences the justice perceptions of other clients (Chen *et al.*, 2023). While, sometimes, the consumer is unaware of the justice received by others for similar service failures, this information is easily accessible from anywhere, and at any time, via the Internet. For example, due to the proliferation of internet-connected devices, consumers have access to

information about the attention paid to, the processes used with and the compensation obtained by others who have suffered similar service failures. For example, massive flight cancellations can occur, and companies such as Ryanair, British Airways and Iberia have faced thousands of customer complaints requesting the refund of the cost of flight tickets. The Ryanair Twitter account features users' posts about their service failure experiences, for example: "I've been waiting since March for the return of my flights cancelled due to the pandemic and I still haven't received anything"; "The link does not work or when it works it does not recognize the reservation code"; "customer service ask me to fill out an application to reject a voucher (which I already rejected at the time of cancellation)" (Knowles, 2020). However, users have also posted positive comments about the management of refunds; "the company has handled returns very quickly, much more than Vueling or other airlines"; "So far I have never had problems with Ryanair"; "100% refund in less than 24 h: I have to say something positive, due to the passing of a close family member, they refunded 100% of the tickets with no charge and in less than 24 h. Deep down, they have a heart" (Trustpilot, 2020, 2023). Each of these experiences is related to one of the three dimensions of justice theory and are clear examples of how users compare their experiences with those of others. Su *et al.* (2021) suggested that companies must manage how consumers communicate their dissatisfaction with service failures via social networks. To do so, companies need to design transparent customer recovery plans that address the different situations that can arise. Frontline customer services should master these plans and follow action protocols designed to make customers feel they are being treated fairly. Transparency could lead companies to strengthen their commitment to quality and provide a strategic advantage. Consumers should be told in their initial contacts with companies what process they will need to go through and what compensation they are likely to receive. This strategy would increase the customer's peace of mind (Siqueira *et al.*, 2020). Thus, empathy, as it influences trust, should be an important characteristic possessed by frontline employees (Flavian *et al.*, 2019); but companies should be cautious about the promises they make, as it has been shown that they influence consumers' expectations and, if the company does not live up to them, this can increase the consumer's dissatisfaction (Simões-Coelho *et al.*, 2023). Our findings are also consistent with Honora *et al.* (2023), who highlighted the fundamental importance of service employees in any recovery strategy. Service companies should carefully select professionals for frontline positions and provide them with continuous training to improve their behavioural skills and with coping strategies, particularly for handling service recovery interactions (Honora *et al.*, 2023). The airline industry might follow the example of the financial sector, which uses personal managers in its online banking. These frontline employees are available every day, at almost any time, to address any questions and solve problems, both by phone and through the online banking channel.

Limitations and suggestions for future research

This research proposes a multistage model of perceived justice and examines the role of social comparison in perceptions of the three dimensions of justice. This issue has been very little explored by marketing scholars and managers. However, our approach has several limitations that suggest other interesting research avenues. First, only one study was undertaken, and the data were collected four years ago, in Spain. Although a single study design is commonly accepted in service recovery research (Bagherzadeh *et al.*, 2020) and justice perceptions research (Blodgett *et al.*, 1997; La and Choi, 2019), other studies proposing cross-cultural and cross-country differences should be tested, and the study might be replicated in another service context to confirm its results (de Juana-Espinosa and Rakowska, 2018). However, this is an exploratory study, and further research is needed to confirm the results. Second, further research is needed to better understand the sequence which the

justice dimensions follow and the relationships proposed in this study. Although we believe that the suggested sequence is the most common, there may be situations where the sequence may differ. For example, where a company detects a service failure before its customers detect it and decides to refund them part of the amount charged without contacting them. In this case, distributive justice would precede the previous dimensions, thus altering the sequence and relationships. In fact, if distributive justice has the greatest weight in consumers' perceptions of justice, when it is manifested before the other dimensions it will surely have a great influence on their subsequent perceptions of interactional and procedural justice. Third, consumers' personal traits could affect the degree of influence that a company's attitude towards other customers has on them. For example, an individual's patience level could affect his/her justice perceptions during a service recovery process. Furthermore, future analyses might contrast the influence of the internal (personality) and the external (environment, familiarity with the other consumer(s) and importance of the service) motivations of consumers to compare themselves with other consumers. Fourth, although 49% of the participants said that they had previously experienced a service failure, to safeguard their privacy, the data were presented in an aggregated form. In addition, Netquest subjected the data to an anonymisation process that eliminated values that could be used to identify any individual. However, it would be very interesting to analyse the previous experience variable and identify whether there are differences between customers who have suffered a service failure and those who have not. Fifth, some sectors commonly use robots or chatbots as their first customer service contact. Given that our results have shown that interactional justice is crucially important, it would be very interesting to examine how new technologies affect justice perceptions. In conclusion, to generalise our results this research could be replicated in other service sectors, such as hotels, car rental and retail stores.

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Appendix

The supplementary material for this article can be found online.

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Zooming into paternalistic leadership: evidence from high power distance culture

Paternalistic leadership and turnover intention

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Abstract

Purpose – Nurses' turnover intention has become a major issue in developing countries with high power distance cultures. Therefore, the authors attempt to investigate how turnover intention among nurses' can be reduced through paternalistic leadership (PL). The authors further investigate the mediating role of job satisfaction between the associations of benevolent, moral and authoritarian dimensions of PL with turnover intention. Finally, the authors examined perceived organizational support (POS) as a conditional variable between job satisfaction and turnover intention.

Design/methodology/approach – The authors collected data from 374 nurses working in public and private hospitals of high power distance culture using a questionnaire-based survey on convenience basis.

Findings – Structural equation modeling confirms that benevolent and moral dimensions of PL positively affect nurses' job satisfaction which helps them reduce their turnover intention. While the authoritarian dimension of PL negatively affects job satisfaction to further enhance their turnover intention. In addition, the authors noted POS as a conditional variable to trigger the negative effect of job satisfaction on turnover intention.

Research limitations/implications – The authors used a cross-sectional design to collect responses and ensured the absence of common method variance through Harman's Single factor test.

Originality/value – This study identified the mechanism (job satisfaction and POS) through which benevolent, moral and authoritative dimensions of PL predict turnover intention among nurses working in high power distance culture.

Keywords Benevolent leadership, Moral leadership, Authoritarian leadership, Job satisfaction, Turnover intention, Perceived organizational support

Paper type Research paper

Introduction

Nowadays, Asian organizations are striving to compete because of technological and procedural revolutions (Bedi, 2020). The growing competition in Asian cultures has led managers and scholars to rethink the exclusive leadership styles that help to satisfy and retain human resources (Oh and Oh, 2017). Leadership is regarded as a strong predictor of employee work-related outcomes, thereby prevails a need to ponder upon effective leadership styles (Islam *et al.*, 2021a; Ahmad *et al.*, 2021a). Amongst many, one of the least examined leadership styles is paternalistic leadership (PL) style (Rawat and Lyndon, 2016), which

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originated from Chinese ancient Confucianism ideology (Farh and Cheng, 2000) and identified as an effective leadership style in Asian cultures (Nazir *et al.*, 2021).

PL style has recently gained researchers' attention and is still considered a new leadership style (Lau *et al.*, 2019). This is the reason that studies have used numerous terms to define PL such as uneven power relations, unquestionable obedience and feeling of personal loyalty towards leaders (Weber, 1968). However, the latter studies opposed the authoritarian view of PL and considered it a three-dimensional construct, i.e. benevolence, morality and authoritarianism (Cheng *et al.*, 2004; Farh and Cheng, 2000). This is because paternalism is inferred as managers' sincere and personal interest in employees' off-the-job lives to enhance their welfare (Chen *et al.*, 2014). Paternalistic leaders are "*benevolent*" as they sincerely care for their subordinates' personal and professional well-being, "*moral*" as they exercise high personal virtues and exemplify themselves as a role model for their followers and "*authoritarian*" because of enforced discipline and commanding compliance from their followers on their decisions (Farh and Cheng, 2000; Cheng *et al.*, 2004). Recent studies have identified that paternalistic leaders positively shape their followers' job-related outcomes such as job satisfaction, reduced intent to leave, creativity, self-efficacy, organizational citizenship behavior and organizational commitment (Pellegrini *et al.*, 2010; Hongyu *et al.*, 2012; Bedi, 2020; Nazir *et al.*, 2021; Hawass, 2017); however, there is still need to generalize these findings in various cultures.

Paternalistic leadership (PL) style is perceived differently by western and non-western cultures. For example, Western cultures perceive paternalistic leaders as "*benevolent dictators*" involved in "*non-coercive abuse*"; whereas, non-western cultures perceive such leaders as positive figures (Pellegrini and Scandura, 2008). This is because PL is associated with high-power distance and distinctive authority between superiors and subordinates (Bedi, 2020), which embraces the norms of non-western cultures but are contradictory to the western individualistic and fair treatment beliefs (Aycan *et al.*, 2013). Researchers have identified diverse impacts of the dimensions of PL on followers' job outcomes as *benevolence* and *morality* dimensions positively, whereas, *authoritarian* dimension negatively affect job-related outcomes (Nazir *et al.*, 2021; Hawass, 2017); nevertheless, few of the studies have identified its insignificant association with job outcomes (Erben and Guneser, 2008; Nnaemeka and Onebunne, 2017). These inconsistent empirical findings are not only because of cultural differences (Lau *et al.*, 2019) but also because of lack of sufficient construct in the knowledge repository (Wu and Xu, 2012). According to Lau *et al.* (2019), PL should have been studied as a three-dimensional construct as its dimensions have diverse impacts on employee outcomes.

In a recent meta-analysis, Bedi (2020) remained unable "to identify the relative importance of different dimensions of paternalistic leadership in predicting followers' outcomes (p. 998)" such as job satisfaction and turnover intention, especially in high-power distance cultures (Soomro *et al.*, 2019). In addition, we knew little about such mechanisms and their interactional effects because of the limited empirical studies on PL (Bedi, 2020). Following these milieus, we focused on how moral, benevolent and authoritarian dimensions of PL impact employees' job satisfaction and turnover intention in Pakistan, which has a high-power distance culture (Ahmad Bodla *et al.*, 2019; Nazir *et al.*, 2021). Specifically, drawing upon Blau's (1964) social exchange (SET) and Sidanius *et al.*'s (2000) social dominance theory (SDT), we develop a model that examines job satisfaction as a mediator between PL and turnover intention and perceived organizational support (POS) as a conditional variable on the association between job satisfaction and turnover intention (see Figure 1).

According to SET, human relations are based on *norms of reciprocity* (Gouldner, 1960) that when a party receives something valuable from another party, it tries to reciprocate with similar or greater value (Islam *et al.*, 2016). Suffice to say that when employees perceive their leaders in the best of their interest, in turn, they show greater confidence, loyalty (Pellegrini and Scandura, 2008) and prefer to be with their organization (Bedi, 2020). On the other hand, SDT suggests that all existing human societies are built upon group-based social hierarchies

that provide one-step up status to one group to dominate over the other group (Sidanius *et al.*, 2000). These social hierarchies underlie divisions based on age, gender and arbitrary systems (Bedi, 2020). A group might be dominating another group based on the age system; where adults are given importance and high authority over children and based on a gender system where males have more power and authority over females. In addition to this, a group might dominate over the other based on socially built classes, as formed by arbitrary set systems, such as race, ethnicity and social class (Sidanius and Pratto, 2001). Leaders enjoy dominance and power of decision-making over their subordinates due to one step-up authority provided to them (Cheng *et al.*, 2004). The followers obey their leaders' decisions willingly because of social hierarchical systems and power assigned to leaders (Aycan, 2006).

Hypotheses development

Relationships among benevolent leadership, job satisfaction and turnover intention

Benevolent leadership (BL) is that dimension of paternalistic leadership in which leaders demonstrate individualization and show their sincere concern for their followers' professional and personal well-being (Farh and Cheng, 2000). Benevolent leadership shapes employees' positive work attitudes which contribute to organizational overall effectiveness. According to Chinese ancient Confucian philosophy, benevolent leaders not only support and care for their followers (Farh and Cheng, 2000) but also exercise authority so that followers get to know who their boss is (King and Bond, 1985). Moreover, benevolent leaders assist as mentors (Wang and Cheng, 2010) and help subordinates when arrested in personal and/or familial crises (Farh *et al.*, 2008). This uniqueness not only shapes followers' positive attitudes (job satisfaction and reduced turnover intention) but also creates an ongoing exchange relationship between benevolent leaders and their subordinates (Hwang, 2008).

According to SET, the relationships between two parties are based on *norms of reciprocity* where the receiving party is obliged to pay back with similar attitudes to the giving party (Blau, 1964). Therefore, when employees perceive their leaders as caring and supportive (benevolent leadership) they not only show satisfaction with their job but also are willing to work with the same organization. This is because benevolent leaders always work for the betterment of their followers' well-being (Nazir *et al.*, 2021) which creates a positive workplace environment. Observing the kind concerns of their leaders, employees engender feelings of obedience, trust and loyalty (Farh *et al.*, 2008), which become the basis for their job satisfaction and reduced turnover intention (Chen and Kao, 2009). Thus, we hypothesized:

- H1. Benevolent leadership positively influences employees' job satisfaction (a) and negatively influences employees' turnover intention (b).

Relationships among moral leadership, job satisfaction and turnover intention

Due to tremors stemming from moral and ethical scandals in organizations, moral leadership has gained inimitable significance in leadership research (Bedi *et al.*, 2015). Morality is regarded as an effective means of influencing followers (Yukl, 2010). Leaders' morality is considered as a part of many leadership conceptualizations such as transformational (Burns, 1978), servant (Greenleaf, 1977) and authentic (Avolio and Gardner, 2005); however, in this study, we conceptualized moral leadership as a dimension of paternalistic leadership. Moral leadership includes leaders' honest, virtuous, self-disciplined and unselfish behavior towards the followers (Erben and Guneser, 2008). Few of the researchers have argued that the moral dimension of PL overlaps the concept of ethical leadership. In actuality, both the leadership styles are different as ethical leadership focuses on two-way communication between leader and follower where both managers and subordinates are involved in decision making (Brown and Trevino, 2006). Whereas, the Chinese conceptualization of the moral dimension of PL

emphasizes one-way communication between leader and subordinate where leaders make decisions and followers are expected to obey (Chen *et al.*, 2011). Moral leaders attempt to create a positive work environment through exercising integrity and superior moral values (Bao and Li, 2019), which subordinates reciprocate with positive workplace attitudes (Islam *et al.*, 2021c; Ahmad *et al.*, 2021a).

More specifically, literature is well documented about the associations of moral leadership with job satisfaction and turnover intention (Farh *et al.*, 2006; Liang *et al.*, 2007). Moral leaders reveal superior personal values and utilize their status to act in subordinates' collective interest (Cheng *et al.*, 2004). Indeed, integrity and helping subordinates beyond self-interest are the two crucial characteristics of moral leaders. Exhibiting integrity, moral leaders avoid compromise and undue favors (Bedi, 2020), while through helping subordinates, they enhance their identification and trust (Wu *et al.*, 2012), which creates a positive work environment. Subordinates, when they perceive their leader as a moral, try to follow them and show greater satisfaction (Deng and Chen, 2013) and less turnover intention (Nnaemeka and Onebunne, 2017). These arguments are in line with Blau's (1964) SET that when individuals perceive their leaders avoiding compromises and giving undue favors they try to reciprocate with greater satisfaction and staying with their organization (reduced turnover intention). Thus, we hypothesized:

- H2.* Moral leadership positively influences employees' job satisfaction (a) and negatively influences employees' turnover intention (b).

Relationships among authoritarian leadership, job satisfaction and turnover intention

Being a significant dimension of PL style, the roots of authoritarian leadership (AL) originated from the study of enterprises in the 1970s (Cheng *et al.*, 2000). Most of the researchers have examined AL as an independent leadership style (Kiazad *et al.*, 2010). Authoritarian leadership is referred to as leaders' act of exercising complete control over subordinates and demand; in return, receive strict and unobjectionable obedience from them (Cheng *et al.*, 2004). This act shows a clear superior-inferior relationship between leaders and followers (Zhang *et al.*, 2015). Authoritarian leaders conceal important information from their followers because they do not want them to participate in decision-making, hence, such leaders prefer to be commanding to reprimand subordinates' poor performances (Pellegrini and Scandura, 2008).

AL is broadly practiced in various Asian, Western and Middle Eastern countries (Harms *et al.*, 2018; Siddique and Siddique, 2019). Specifically, this leadership style is more prevalent in collectivistic and high-power distance cultures (Chan *et al.*, 2013). A plethora of literature has argued about the negative impacts of AL on employees' attitudes that have detrimental effects on their task performance (Chen *et al.*, 2014). This is because leaders scoring high on the AL dimension tend to retain power asymmetry (Tsui *et al.*, 2004) and often make unilateral decisions (Aryee *et al.*, 2007). Such controlling behaviors from leaders are referred to as abuse of power for personal concerns (Schuh *et al.*, 2013) as they least bother about their subordinates' well-being (Chan *et al.*, 2013).

According to Bedi (2020), authoritarian leaders exercise their influence on subordinates mostly in two ways, i.e. personal dominance and negative social exchange. As leaders are high-level in the organizational hierarchy, therefore, they exert complete dominance in decision-making (Carson, 1969). Such controlling behaviors by the leaders are felt oppressive by the subordinates resulting in an abusive workplace environment. From a social exchange perspective, when employees perceive their leaders as dominant and controlling, they in response, show more negative attitudes (Farh and Cheng, 2000). Blau's (1964) SET posits that employees negatively reciprocate when perceiving their leaders as having controlling behavior and demanding strict obedience to their decisions. Indeed, the receiver reciprocates negatively when receiving unfavorable treatment from another party

(Gouldner, 1960). Given that, it can be assumed that when employees perceive their leaders as authoritarian, they show decreased job satisfaction and increased turnover intention. Thus, we hypothesized:

- H3.* Authoritarian leadership negatively influences employees' job satisfaction (a) and positively influences employees' turnover intention (b).

Mediating role of job satisfaction

We examined job satisfaction as a mediating mechanism between PL dimensions and turnover intention to extend the literature. The association between employee job satisfaction and intent to quit the workplace is well-established in the literature and is supported by ample empirical evidence. Lambert *et al.* (2001) argued that the impact of job satisfaction on intent to leave the organization is natural, which has been confirmed by Griffeth *et al.* (2000). Griffeth *et al.*'s (2000) meta-analysis revealed an average correlation of about -0.19 between job satisfaction and turnover intention. The theoretical foundations regarding the satisfaction-turnover relationship were derived from the work of March and Simon (1958). They proposed that job satisfaction is the primary antecedent of perceived desirability of movement, leading to employees' behavioral intent to leave the workplace (Lee *et al.*, 1999). Indeed, the intention to quit the current job and to seek other employment opportunities in the market depends upon how much an employee is satisfied with his/her job (Jang and George, 2012). Being more specific, inferences can be drawn that higher the job satisfaction, the lower will be the intentions to quit and the lower the job satisfaction, the higher will be the intentions to quit (Ahmad *et al.*, 2019). This inference can further be supported by SET that employees' level of job satisfaction depends upon their treatment by their organization (positive or negative leadership) which they reciprocate accordingly (Ahmed *et al.*, 2015).

Drawing upon SET, the aforementioned literature has confirmed that the dimensions of PL (i.e. moral, benevolent and authoritative) have varying impacts on followers' level of job satisfaction and intention to quit (see H1-H3). Similarly, job satisfaction has been identified as a predictor of turnover intention. Still, a recent meta-analysis by Bedi (2020) has identified less empirical evidence about the mechanism between three-dimensional PL with employees' attitudes (job satisfaction and turnover intention here). Specifically, we argue that when employees perceive their leaders as benevolence and morals show greater levels of job satisfaction which helps them reduce their intention to leave the organization. On the other hand, when employees perceive their leaders as authoritarian, they exhibit a low level of satisfaction with their job which enhances their intention to leave the organization. Thus, to examine these assumptions we hypothesize:

- H4.* Job satisfaction negatively influences employees' turnover intention.
- H5.* Job satisfaction mediates the association of benevolent (a), moral (b) and authoritarian (c) leadership with employees' turnover intention.

The moderating role of perceived organizational support (POS)

POS is employees' perception of being cared by their organization (Islam *et al.*, 2015). According to Eisenberger *et al.* (1986), POS is an outcome of an exchange relationship between employees and their organizations because the extent of such relations demonstrates that employees' involvement is recognized and valued by their organization. Employees' POS gets impacted by many factors such as money, credit, appreciation, recognition and encouragement (Eisenberger *et al.*, 1986). According to Islam and Ahmed (2018), POS is usually fostered by two significant perceptions of employees; one is through personifying the organization and the other is through rewards as distributed by the

organization. Through personification, employees assign human characteristics to organizations and through rewards where employees perceive favored or unfavored treatment because of uncontrollable external organizational constraints (Eisenberger *et al.*, 1997). In other words, it can be inferred that the aforementioned two beliefs assist to identify the resources made available by the organization for employee-organization social exchange relationships (Loi *et al.*, 2006).

POS is activated when there is a social exchange process between employee and organization through the norm of reciprocation which creates a sense of employee obligation (Galletta *et al.*, 2011). This reciprocation might generate positive attitudinal and behavioral work-related outcomes such as high intent to stay with the organization and lower turnover (Tekleab *et al.*, 2005; Mishra and Ghosh, 2020; Srivastava and Agrawal, 2020). Employees' positive feelings about their supervisors enhance their POS which creates a sense of obligation to reciprocate back to their organization (Jeung *et al.*, 2017) and helps them to reduce their turnover intention (Eisenberger *et al.*, 2002). This is because, employee consider their leaders/supervisors as the representative of their organization (Ahmad *et al.*, 2021b) and their style help them reciprocating towards their organization (Islam *et al.*, 2021d). According to Hur *et al.* (2015) "since employees in a collectivistic society are more likely to perceive themselves to be part of the organization, POS may function as an important confounding variable on the relationship between psychological state and job-related outcomes" (p. 607). Therefore, many researchers have examined POS as a moderator between employees' job-related attitudes. For example, Sher *et al.* (2019) identify POS buffering the effect of leader-member exchange on expectorates voice in Taiwan. Yoon *et al.* (2020) noted POS strengthening the association between psychological ownership and knowledge-creating in Korea. Similarly, Srivastava and Agarwal (2020) noted POS buffering the negative association between burnout and turnover intention, whereas Duke *et al.* (2009) noted it buffering the negative association between emotional labor and job satisfaction. However, literature is scant about how POS moderates the association between job satisfaction and turnover intention. Therefore, this study argues that employees' perception of support from their organization (in which leaders' style also contribute) may serve as a conditional variable that strengthens the negative association between job satisfaction and turnover intention. Suffice to say that, when employees feel satisfaction at their workplace, they are more likely to stay in the organization, in such situations their perception of support from their organization signals their psychological process to continue with their decision to be with their organization. Set also supports the same arguments that employees reciprocate their perceptions of being cared for through positive attitudes (Job satisfaction) which diminish their negative attitudes (turnover intention) (Blau, 1964). Thus, we hypothesize:

- H6. POS moderates the negative association between job satisfaction and employees' turnover intention such that employees with high POS may strengthen this relationship.

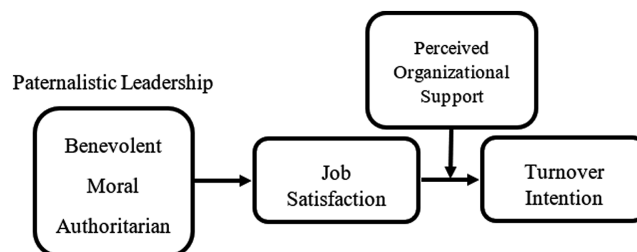


Figure 1.
Conceptual model

Methods

Participants and data collection procedure

Past studies have identified that PL is congruent with collectivist and high-power distance cultures (Pellegrini *et al.*, 2010; Ahmad Bodla *et al.*, 2019) as such cultures tend to have a high level of paternalism. Literature has suggested that the effect of PL in high-power distance countries would be greater than those of low-power distance countries (Bedi, 2020). Further, there is a need to study PL in both public and private sectors (Jing-Horng *et al.*, 2015; Chine *et al.*, 2006). Therefore, we selected nurses working in both public and private hospitals of Pakistan (a high-power distance country) because of several reasons.

According to the statistics given by the United Nations (2020), a single nurse in Pakistan has to care for twenty-five patients and five doctors, which is at a higher cost as compared to other developing countries. The Pakistani government has reported a shortage of 60,000 nurses in the country (Ali *et al.*, 2021). Studies have suggested workplace bullying (Islam *et al.*, 2021b), brain drain, less monetary incentives and high turnover (Islam *et al.*, 2018) as the reasons behind this shortage. Amongst these, turnover is the biggest reason behind this shortage that healthcare management is facing (Shahzad and Malik, 2014). As, employees are regarded as the real assets of any organization (Islam and Ahmed, 2018); hence, are essential to retain. Therefore, the current study has presented a model that may assist in retaining nurses through effective leadership styles (PL here). We used item-response theory to select a sample of 660 (Islam and Tariq, 2018). Specifically, we select the criteria of twenty respondents against each item of the questionnaire ($33 \times 20 = 660$). We received 394 responses between June to December 2020 (60% of response rate). We visited various public and private hospitals and showed them the letter (issued by the institute of business administration, University of the Punjab) to allow us to collect data. After obtaining permission from the heads, we ensure nurses about the confidentiality of their responses.

Nurses were also asked about their demographic characteristics such as gender, age and qualification. Respondents were eventually found to be evenly distributed based on gender (Male: $N = 198$, 50.5%, Female: $N = 194$, 49.5%). In addition, the majority of the respondents were in the age bracket of 21–25 years (50.79%), holding a master's degree (45.49%).

Measures

All the responses were collected on a five-point Likert scale ranging from 1-Strongly Disagree to 5-Strongly Agree. All the scales to measure the constructs were adopted from previous studies with proven internal consistency reliabilities.

Paternalistic leadership. We used three dimensions of paternalistic leadership namely benevolent, moral and authoritarian leadership. The measurement scales for these dimensions were adopted from Cheng *et al.*'s (2004) study. These scales were used to evaluate the employees' perception of how often their leaders revealed each leadership behavior. This scale has been validated in the Asian context (Cheng *et al.*, 2014; Dedahanov *et al.*, 2016; Chaudhary *et al.*, 2021). *Benevolent leadership* was assessed through six items with 0.78 as the value of its reliability. A sample item was "My supervisor ordinarily shows a kind concern for my comfort". The current study used five items of *moral leadership* and noted its reliability as 0.76. A sample item was "My supervisor set him/herself a good role model to follow". The *authoritarian leadership* dimension was assessed through six items with a reliability of 0.71. A sample item was "My supervisor always behaves in a commanding fashion in front of employees".

Turnover intention. We used Kuvaas's (2008) five items to measure employees' intention to leave their organization. The study noted 0.82 as the value of its reliability. A sample item was "I will probably look for a new job in the next year".

Job satisfaction. A three item scale of Cammann *et al.* (1983) was used to measure employees' level of job satisfaction and noted 0.80 as the value of its reliability. A sample item was "I am satisfied with my current job".

Perceived organizational support. We used Eisenberger *et al.*'s (1986) short eight item scale of POS and noted 0.85 as the value of its reliability. A sample item was "My organization cares about my well-being".

Results

Initially, we test the data for missing values, outliers and normality. Further, we conducted confirmatory factor analysis (CFA) and then hypotheses were tested by examining structural model and hierarchical regression. As the data was personally administered, therefore, it was free from missing values. We applied Mahalanobis test to identify 18 outliers ($p < 0.000$); therefore, further analyses were conducted on 374 responses. Following Byrne (2010), we examined the values of skewness (± 1) and kurtosis (± 3) for the normality which were well within the range. Multicollinearity was examined following the criteria of Tabachnick and Fidell (2007) that the correlational values among variables should be less than 0.85 (See Table 1). Moreover, we conducted CFA to examine the validity, reliability and unidimensionality of the variables under study (Byrne, 2010). We examined the values of "Chi-Square/Degree of Freedom ($\chi^2/df \leq 3.0$), Comparative Fit Index ($CFI \geq 0.90$), Root Mean Square Error of Approximation ($RMSEA \leq 0.08$) and Goodness of fit index ($GFI \geq 0.90$)" and measurement model was found to be fit, i.e. $\chi^2/df = 2.38$, $GFI = 0.91$, $CFI = 0.93$, $RMSEA = 0.037$. We followed Hair *et al.* (2010) for factor loading values (i.e. $FL > 0.50$); Bagozzi and Yi (1988) for composite reliability (i.e. $CR \geq 0.60$) and average variance extracted (i.e. $AVE \geq 0.50$); Fornell and Larcker (1981) to examine whether the values of AVE are greater than the values of MSV; and Cronbach (1951) for reliability (i.e. $\alpha \geq 0.70$). The values of CR and AVE were examined for convergent validity, MSV for discriminant validity, α for reliability. The values in Table 1 confirm the reliability and validity of the scales used in this study. We further examined Harman's Single-factor to detect common method variance (CMV) and one factor was noted to explain 36.89% variance which is less than 50% (Podsakoff *et al.*, 2012).

Descriptive and correlation analysis

The values of descriptive statistics (i.e. mean and standard deviation) and correlations among observed variables are shown in Table 1. The mean values of benevolent ($M = 3.81$) and moral ($M = 3.57$) dimensions show that respondents were agreed about the presence of such leadership, however, were neutral regarding authoritarian ($M = 2.98$) dimension of PL. Further, we noted that benevolent and moral dimensions positively ($r = 0.38$ and 0.34 , $p < 0.01$), whereas, authoritarian dimension negatively correlate with job satisfaction ($r = -0.31$, $p < 0.01$). Similarly, benevolent and moral dimensions negatively ($r = -0.26$ and -0.23 , $p < 0.01$), whereas, authoritarian dimension positively correlate with turnover intention ($r = 0.41$, $p < 0.01$). Finally, we noticed that satisfied employees are less likely to have turnover intention ($r = -0.43$, $p < 0.01$).

Hypotheses testing

We examined the structural model to test the hypotheses. The values in Table 2 confirmed that benevolent ($\beta = 0.37$, $CR = 6.09$, $p = 0.00$) and moral ($\beta = 0.43$, $CR = 5.48$, $p = 0.00$) dimensions positively, whereas, authoritarian ($\beta = -0.39$, $CR = 5.16$, $p = 0.00$) dimension of PL negatively influence job satisfaction. These results are in line with H1a, H2a and H3a of the study. On the other hand, we noted that benevolent ($\beta = -0.21$, $CR = 3.79$, $p = 0.00$) and moral ($\beta = -0.26$, $CR = 4.37$, $p = 0.00$) dimensions negatively, however, authoritarian ($\beta = 0.32$, $CR = 5.63$, $p = 0.00$) dimension of PL positively influence turnover intention. These results are in line with H1b, H2b and H3b of the study. In addition, we noted a negative

Variables	1	2	3	4	5	6	α	Mean	SD
1-Benevolent Leadership	1						0.78	3.81	0.79
2-Moral Leadership	0.55**	1					0.76	3.57	0.82
3-Authoritarian Leadership	-0.11*	-0.15*	1				0.71	2.98	0.57
4-Turnover Intention	-0.26**	-0.23**	0.41**	1			0.82	3.62	0.66
5-Job Satisfaction	0.38**	0.34**	-0.31**	-0.43**	1		0.80	3.78	0.83
6-Perceived Organizational Support	0.25**	0.31**	-0.19*	-0.27**	0.17*	1	0.85	3.27	0.64
Factor Loading (FL)	0.69-0.88	0.73-0.83	0.68-0.86	0.81-0.87	0.78-0.83	0.66-0.89	-	-	-
Average Variance Extracted (AVE)	0.61	0.64	0.59	0.64	0.62	0.58	-	-	-
Composite Reliability (CR)	0.84	0.79	0.73	0.81	0.83	0.77	-	-	-
Maximum Shared Variance (MSV)	0.35	0.48	0.29	0.44	0.51	0.51	-	-	-
Note(s): ** $p < 0.01$, * $p < 0.05$									

Table 1.
Descriptive statistics
and correlations

influence of job satisfaction on turnover intention ($\beta = -0.48$, $CR = 3.91$, $p = 0.00$), which supports H4 of the study.

To test the mediation, we assessed the significance of indirect effects which were calculated by multiplying the beta coefficients of (Independent variable \rightarrow Mediating variable) with (Mediating variable \rightarrow Dependent variable) (Byrne, 2010). The study noted a significant indirect effect of benevolent leadership ($\beta = -0.18$, $CR = 3.11$, $p = 0.002$), moral leadership ($\beta = -0.21$, $CR = 4.21$, $p = 0.00$) and authoritative leadership ($\beta = 0.19$, $CR = 3.58$, $p = 0.001$) on turnover intention via job satisfaction. These results are in line with H5a, H5b and H5c of the study and confirmed the explanatory role of job satisfaction (see Table 3).

Finally, we examined the moderating role of POS using two-step hierarchical regression. First of all, we computed an interactional term between Job satisfaction and POS (i.e. $JS \times POS$). Then in the first step of regression, job satisfaction and POS were regressed with turnover intention and both were noted to have a negative and significant effect on turnover intention ($\beta = -0.39$ and -0.23 , $p < 0.01$). In the second step, the interactional term ($JS \times POS$) was regressed with turnover intention and its significant effect with 18% variance was noted ($\beta = -0.44$, $p < 0.01$). This confirms the moderating role of POS (see Table 4). Further, we conducted a slope of the moderation (see Figure 2). The slopes

Table 2.
Results of
structural model

Hypotheses	β	CR	SE	p	Verdict
Benevolent Leadership \rightarrow Job Satisfaction	0.37	6.09	0.042	0.00	Accepted H1a
Moral Leadership \rightarrow Job Satisfaction	0.43	5.48	0.053	0.00	Accepted H2a
Authoritarian Leadership \rightarrow Job Satisfaction	-0.39	5.16	0.067	0.00	Accepted H3a
Benevolent Leadership \rightarrow Turnover Intention	-0.21	3.79	0.059	0.00	Accepted H1b
Moral Leadership \rightarrow Turnover Intention	-0.26	4.37	0.034	0.00	Accepted H2b
Authoritarian Leadership \rightarrow Turnover Intention	0.32	5.63	0.048	0.00	Accepted H3b
Job Satisfaction \rightarrow Turnover Intention	-0.48	3.91	0.036	0.00	Accepted H4
POS \rightarrow Turnover Intention	-0.22	2.97	0.052	0.00	–

Table 3.
Mediation through
indirect effects

Hypotheses	β	CR	SE	p	Verdict
Benevolent Leadership \rightarrow Job Satisfaction \rightarrow Turnover Intention	-0.18	3.11	0.068	0.002	Accepted H5a
Moral Leadership \rightarrow Job Satisfaction \rightarrow Turnover Intention	-0.21	4.21	0.047	0.000	Accepted H5b
Authoritarian Leadership \rightarrow Job Satisfaction \rightarrow Turnover Intention	0.19	3.58	0.039	0.001	Accepted H5c

Table 4.
Hierarchical regression
for moderation

Variables	M1(β)	M2(β)
Step-1		
Job satisfaction (JS)	-0.39**	
Perceived organizational support (POS)	-0.23**	
R^2	0.21	
Step-2		
$JS \times POS$		-0.44**
R^2		0.39
ΔR^2		0.18

Note(s): ** $p < 0.01$

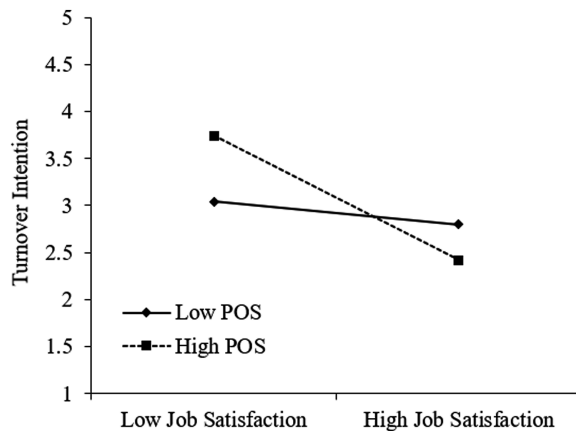


Figure 2.
Slop of moderation

confirm that employees who perceive a high level of support from their organization are more likely to trigger the negative effect of job satisfaction with turnover intention (H6 is accepted).

Discussion

Most of the studies have examined paternalistic leadership (PL) as a construct; however, less has been focused on its dimensions, i.e. benevolent, moral and authoritative leadership (Bedi, 2020; Nazir *et al.*, 2021). In addition, although PL shapes employees' positive job-related outcomes, still studies on its mechanisms are scant (Chaudhary *et al.*, 2021; Lau *et al.*, 2020). With these backdrops, we investigate how the dimensions of PL affect employees' turnover intention through job satisfaction. In addition, we examined perceived organizational support (POS) as a conditional variable on the association between job satisfaction and turnover intention. As PL style is more prevalent in high-power distance countries (Ahmad Bodla *et al.*, 2019); therefore, we collected data from the nurses working in public and private hospitals of Pakistan.

The study noted that employees perceive their leaders' benevolent and moral styles as positive, in turn, show greater levels of satisfaction with their job which ultimately reduces their intention to leave the organization. Literature has also suggested that positive leadership enhances subordinates' positive (job satisfaction) and reduces negative (turnover intention) workplace attitudes (Islam *et al.*, 2021c). For example, Lin and Liu (2017) conducted a study on employees working in Taiwan's banking sector and noted ethical leadership reduces their turnover intention. Ren and Chadee (2017) studied 388 professionals from eight organizations in Beijing, China and noted ethical/moral leadership enhances employees' job satisfaction. Similarly, studies have noted that benevolent leaders positively influence their subordinate's performance (Chan, 2017) and well-being (Erkutlu and Chafra, 2016). According to the findings of Bedi's (2020) meta-analysis on PL, employees show a greater level of job satisfaction and reduced turnover intention towards those leaders who care about their welfare. These findings are in line with SET that individuals reciprocate their positive leaders through positive attitudes (Blau, 1964).

On the contrary, we noted, when leaders show controlling behaviors and demand strict obedience from their subordinates (i.e. authoritative leadership), the latter tend to show more negative attitudes and behaviors such as decreased job satisfaction and increased intention to quit the workplace. These findings are in line with the findings of Schaubroeck *et al.* (2017) and Islam *et al.* (2020a) that employees respond to their abusive/authoritative leaders through

greater job dissatisfaction and leave intention. Supervisors/leaders are at the higher level of organizational hierarchy and subordinates cannot directly counter them; therefore, they reciprocate to such leaders through negative attitudes (Blau, 1964) such as turnover intention and job dissatisfaction.

We further noted job satisfaction explaining the associations of benevolent, moral and authoritarian dimensions of PL with turnover intention. Specifically, job satisfaction was found to negatively explain the associations of benevolent and moral dimensions with turnover intention; whereas positively explain the negative association between authoritarian dimension with turnover intention. This is because, when employees perceive the positive side of their leaders (benevolence and moral), reciprocate positively (i.e. enhanced job satisfaction and reduced turnover intention) and when perceive the negative side of their leaders (authoritarian) reciprocate negatively (decreased job satisfaction and greater turnover intention). These findings are in line with social exchange theory. Finally, we identified POS as a conditional variable that strengthens the negative association between job satisfaction and turnover intention. According to Hur *et al.* (2015), individuals in collectivist cultures prefer to be a part of their organization. POS creates a sense of ownership (Galletta *et al.*, 2011) among employees that affect their psychological state. Therefore, POS helps employees to further trigger the negative association between job satisfaction and turnover intention.

Theoretical implications

The study has several theoretical implications. First, studies on paternalistic leadership have been conducted in non-Western and Western cultures (Koveshnikov *et al.*, 2022; Chan, 2017) with varying results. House *et al.* (2014) noted that in the western culture paternalistic leadership (specifically authoritarian and benevolence dimensions) negative affect subordinates' attitudes. However, in high-power distance cultures (e.g. Russia and China) it positively affects subordinates' attitudes (Koveshnikov *et al.*, 2020). Infact, studies have identified that authoritarian and benevolence styles differently affect the people of the same culture (Shen *et al.*, 2019). This means that the dimensions of PL cannot be understood by means of societal-level differences; hence, studies need to pay more attention (Koveshnikov *et al.*, 2022). Similarly, Nazir *et al.* (2021) also suggest shedding light on the consequences of PL in various high-power distance cultures. Therefore, we fulfill this existing literary gap by examining the same in Pakistan. Pakistan has a high-power distance culture (Mangi *et al.*, 2012) with a collectivistic society (Islam *et al.*, 2020b). According to Nazir *et al.* (2021), "the organizational context in Pakistan characterizes high uncertainty avoidance organizational practices" (p. 1362), including centralization, nepotism and corruption. In addition, people follow the rule of "might is right", which largely focuses on group, race, family and cultural values and ignores individual values. In this family-oriented culture, decisions are made by the head of the family which members have to accept without reservations (Islam *et al.*, 2019). As individuals bring similar values in their workplace, therefore, help them to accept paternalistic leadership (Nazir *et al.*, 2021). Koveshnikov *et al.* (2022) also argued that individuals response to their leaders as per their cultural orientation.

Although studies have noted employees' high tolerance level towards abusive/authoritative leaders in high-power distance cultures (Naseer *et al.*, 2018), still we found, such leadership is negatively associated with employees' job-related attitudes (turnover intention and job satisfaction). Therefore, our findings add to the existing literature of PL in high-power distance cultures and suggest that individuals in such cultures are not necessarily to reciprocate negative leadership style with positive attitudes. This may be because, sometimes the leader-follower relationship depends upon followers' perception of having similar personalities with their leaders (Li and Sun, 2015). This means that employees

perceive their leaders' personalities through shared values and beliefs and if found similar to theirs, show similar reciprocations.

Second, our study explains the mechanism through which variation in employee turnover intention can be analyzed. The study noted that when employees perceive their leaders as moral and benevolent, they tend to be more satisfied with their job which reduces their intention to leave the organization. However, when employees perceive their leaders as authoritative, they show less satisfaction which leads to greater turnover intention. Employees with the greater intention to leave the organization become ready to change their organization at the first opportunity (Islam *et al.*, 2013). Finally, our study investigates POS as a conditional variable that triggers the negative effect of job satisfaction on turnover intention. Most of the past studies have used POS as a predictor of job satisfaction and turnover intention, however, our study shows a new direction to the researcher by suggesting the conditional role of POS. Fourth, our findings contribute to SET that leadership is considered an important aspect of exchange relations.

Practical implications

Our findings have several implications for the management. First, employee turnover costs an organization ten times greater than retaining an existing one; therefore, our study suggests management not to ignore leadership. Because, employees perceive their leaders/supervisors as representative of their organization, hence reciprocate accordingly. More specifically, when employees perceive their leaders' morals and benevolence, they not only prefer to continue with the same organization but also exhibit greater performance and vice versa. If organizations fail to engage their employees through positive gestures (effective leadership) may face serious consequences (employee turnover). Our findings let the managers understand that the social dominance culture in Pakistan seems to be productive up to some extent but if authority is not exercised rightly at the right time, organizations can have more chances to lose talented employees (Chen and Kao, 2009). Therefore, our study suggests management to train their leaders/supervisors regarding benevolent and moral values.

Our findings also suggest that positive leadership is not sufficient to retain employees, the role of other organizational factors (such as POS) is equally important. Paternalistic leaders have special characteristics (like caring for employees' well-being) which employees consider their leader's gestures and not the gestures by their organization, thereby more reciprocal towards leaders rather than organizational goals. In such situations, POS serves as a conditional variable that helps them continue with their organization. Management needs to understand that employees build POS based on mutual belief that if they would be cared by their organization, in return, they will serve their organization. In addition, employees perceive their organizational support positively when their leaders/supervisors would treat them with positive styles (benevolence and moral). Rhoades and Eisenberger (2002) also emphasized that management by working on POS could get the desired results from the employees. Thus, management should take initiatives towards "employee care" which is possible through employee-centric policies and positive leadership in the organization. Working on positive leadership (moral and benevolence styles) and employee care (POS) management can better build a retention strategy.

Limitations and future recommendations

Our study is not free from limitations. First, we used a cross-section design to collect data. Cross-section design is associated with CMV and restricts causality. Although, we applied Harman's Single factor test where CMV was not an issue in this study, still, future researchers are suggested to use cross-section time-lagged design to better understand how employees'

perception and attitudes vary (Islam and Irfan, 2022). In addition, we suggest future researchers conduct longitudinal designs to better predict causality. Second, the benevolent, moral and authoritative dimensions of PL may produce social approbation effect (Chan, 2017); therefore, future researchers can use other data collection methods (i.e. observation or interview).

Third, our study noted positive outcomes of benevolent and moral leadership; nevertheless, literature has identified their negative outcomes (Rui and Xinqi, 2020). Therefore, future studies are suggested to examine how and when benevolent and moral dimensions negatively affect employees' work-related outcomes. Fourth, we noted that most of the respondents were aged between 21 and 35 years (millennials). Millennials are more sensitive and stimulated to various organizational factors; therefore, examining generation X (mature and hard worker) may produce different results. Finally, as the empirical evidence on the mechanism between the dimensions of PL with employees' job-related outcomes are limited, therefore, the future researcher can use psychological ownership, well-being as mediating variables and psychological contract breach, person-job fit as moderating variables.

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