



**Innovation, Entrepreneurship,
and Success: Insights
from Diverse Ventures**

Edited by

Anna Ujwary-Gil

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The JOURNAL OF ENTREPRENEURSHIP, MANAGEMENT AND INNOVATION

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Expatriation-enhanced competencies: A multiple case study of technology-based entrepreneurs

Hilka Pelizza Vier Machado¹ , Jörg Freiling² 

Abstract

PURPOSE: Facing the research gap of entrepreneurial learning by self-expatriated technology-based entrepreneurs, the purpose of this research is to explore those entrepreneurs' beliefs and experiences across expatriation to identify the enhancement of their competencies. **METHODOLOGY:** Within a qualitative and exploratory multiple case theory-building approach, data was collected from twelve technology entrepreneurs from Brazil, Mexico, Germany, and Israel that went to the following destination countries: Spain, United Kingdom, United States, Germany, Ireland, Turkey, and the Netherlands. With interview data as the primary source, the data analysis rests on a qualitative content analysis. **FINDINGS:** Data allows structuring techpreneurs' experience of expatriation along the following steps: (a) arrival in the destination country and initial process of socialization, (b) engaging in activities to get familiar with the culture of the destination country, (c) the gradual comprehensive understanding of the new context, and (d) comparisons between the home and destination country. Expatriation had an evident impact on the technology-based entrepreneurs that materializes in three groups of competencies: entrepreneurial competencies, knowledge and innovative competencies, and international competencies. Entrepreneurial competencies relate to relational and behavioral skills and the learning of doing business in different contexts. Concerning knowledge and innovative competencies, creativity, learning new techniques and international innovation environment stand at the fore. Finally, international competencies relate to the acceptance of different cultures (multicultural learning and perception of cultural differences), developing a sense of an international community and an international innovation culture. **IMPLICATIONS:** This study evidenced the influence of expatriation

1 Hilka Pelizza Vier Machado, Professor at UniCesumar University and the Federal University of Paraná, Brazil. Researcher at the Brazilian Council for Scientific and Technological Development, Brazil, e-mail: hilka.machado@unicesumar.edu.br (ORCID: <https://orcid.org/0000-0002-2554-0025>).

2 Jörg Freiling, Full Professor, Faculty for Business Studies and Economics, LEMEX – Chair for Small Business & Entrepreneurship, University of Bremen, Enrique-Schmidt-Str. 1, 28359 Bremen, Germany, e-mail: freiling@uni-bremen. (ORCID: <https://orcid.org/0000-0001-8310-7740>).

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*experiences on the training of skills of technology-based entrepreneurs, in a specific approach to entrepreneurial, innovative, and intercultural competencies. The research portrays self-expatriation as an opportunity for technology-based entrepreneurs to develop different competencies being helpful to innovate, to manage business and to operate in international markets. Universities and innovators may recognize their discretion to develop programs for people like former students who want to self-expatriate. In the same vein, government can design policy to attract self-expatriate in innovations hubs, considering that local inhabitants can benefit from the cultural exchange. **ORIGINALITY AND VALUE:** This study contributes to better understanding the influence of self-expatriation experiences on the development of skills of technology-based entrepreneurs. Compared to previous studies, it advances research through providing a wider range of learning from expatriation experiences beyond the effect of internationalization on market knowledge and cultural aspects. Furthermore, this study focuses the process, not the results of self-expatriation to understand entrepreneurs' learning.*

Keywords: technology-based entrepreneurs, innovation, entrepreneurs, skills, competencies, expatriation

INTRODUCTION

International business and entrepreneurship studies have highlighted the role of entrepreneurs in the internationalization process and cross-cultural experiences of entrepreneurs allowing access to different sources and kinds of knowledge and technology (Adler, 1983; Black & Mendenhall, 1990; Black & Gregersen, 1991; Liu, Wright, Filatotchev, Dai, & Lu, 2010; Schweizer, Vahlne & Johanson, 2010; Sullivan & Marvel, 2011; Brzozowski, Cucculelli, & Surdej, 2017; Deligianni et al., 2019; Baier-Fuentes et al., 2019; Majdouline, El Baz, & Jebli, 2022). One type of cross-cultural experience is expatriation, that is, an immersion in a different culture and institutional context that implies coping with difficulties and unknown situations (Terjesen & Elam, 2009).

While expatriation takes place in various shapes (O'Byrne, 2018), self-initiated expatriation refers to individuals temporarily relocating on their own initiative to the desired host country (Suutari & Brewster, 2000), and searching for skilled/professional qualifications (Cerdin & Selmer, 2014). To date, research on this topic did not thoroughly analyze entrepreneurial knowledge and the effect of learning on entrepreneurial competencies during expatriation. Specifically, research on entrepreneurial learning in international contexts by self-expatriated technology entrepreneurs is limited (Szkudlarek, 2010). Experiences abroad can fuel the development of competencies of this specific category of entrepreneurs, as particularly tech entrepreneurship requires the rapid and intensive development of knowledge and innovation skills (Schweiger, 2012). Expatriation can facilitate

the development of new, often tacit knowledge (Burmeister et al., 2015; Junge, Diez, & Schätz, 2015; Liu et al., 2010; Lin, Lu, Liu, & Zhang, 2016; Wang, Zweig, & Lin, 2011; Xiauohui, Buck, & Wright, 2009). As prior research has been silent in this regard, this research seeks to enhance knowledge through exploring the set of skills and entrepreneurial learning derived from expatriation, unraveling self-expatriation experiences, and specifying competencies in the particular light of self-expatriation of technology-based entrepreneurs and their beliefs on skill development during expatriation.

On this note, the purpose of this research is to explore self-expatriated technology-based entrepreneurs' beliefs and experiences across expatriation to identify the enhancement of their competencies. The according research question (RQ) is:

RQ) What are the beliefs of technology-based expatriate entrepreneurs about the development of their competencies during the self-expatriation?

To respond to this question, this research employs a multi case theory-building design. It rests on an in-depth analysis of twelve self-initiated expatriate technology-based entrepreneurs. The entrepreneurs are from different American or European nationalities with expatriation experiences in seven destination countries.

This research contributes to the knowledge of competencies by evidencing the influence of self-expatriation experiences on the learning of skills of technology-based entrepreneurs. While most studies focus only on the effect of internationalization on market knowledge and cultural aspects, this study accentuates learning from self-expatriation experiences and specifies the competency-building character of self-expatriation. Furthermore, this study focuses on the process, instead of the results, of self-expatriation to understand the learning of entrepreneurs at the individual level (Doherty, 2013).

This paper proceeds with conceptual foundations regarding the competencies of technology entrepreneurs and expatriation. The subsequent section describes the method and design, followed by results, discussion, and conclusions.

LITERATURE REVIEW AND CONCEPTUAL BACKGROUND

Technology-based entrepreneurship

Based on an understanding of entrepreneurship as founding new, small, independent businesses based on perceived entrepreneurial opportunities (Shane & Venkataraman, 2000; Ejermo & Xiao, 2014; Ratinho, Harms & Walsh, 2015), the literature contributed to a nuanced understanding of technology-based entrepreneurs (hip) (Shane, 2001; Giones & Brem, 2017; Majdouline et al., 2022). Commencing with a more *processual* interpretation of technological entrepreneurship, Shane and Venkataraman (2003, p. 181) pointed to "(...) the process by which entrepreneurs assemble organizational resources and technical systems, and the strategies used by entrepreneurial firms to pursue opportunities". This implies creating, developing, and commercializing new technological solutions against internal and external resistance in connection with the need to scale the new solution – often in international markets. A more *asset-centered* understanding regards a technology-based venture as a project that "assembles and deploys specialized individuals and heterogeneous assets that are intricately related to advances in scientific and technological knowledge for the purpose of creating and capturing value for a firm" (Bailetti, 2012, p. 9). *Skill-based* understandings, however, pinpoint the technological innovation as a cornerstone and target of 'techpreneurship' – and regard the integration of technology and business skills as pivotal for implementation (Matejun, 2016; Mosey et al., 2016). Both competencies are vital as technological innovation, rooted in science and engineering, often implies creating new or disrupting old markets – based on technological and managerial moves (Beckman et al., 2012). It also implies accessing international markets early or right from the beginning, which International Business scholars subsume under the 'born global' umbrella (Rialp et al., 2005).

While all the mentioned interpretations contribute to a sound understanding of the nature of technological entrepreneurship, this study particularly builds on skill-based understanding. Given the specific context of expatriation, competencies to cope with content issues of technologies and international or intercultural contexts stand at the fore – and call for learning-based skill development as well as skill refinement and reconfiguring (Teece, 2007; Freiling, Gersch & Goeke, 2008).

Technology-based entrepreneurs, (self-)expatriation, and competencies

Expatriation is an intercultural experience that confronts the expatriate with an unknown context and provokes learning processes to get used to the new setting (Terjesen & Elam, 2009). With the globalization wave of the last decades, the type of assigned expatriation, implying a displacement to a destination country for the sake of work on an extended assignment and in search of an international career, was very prominent in the literature (Howe-Walsh & Schyns, 2010; McNulty & Brewster, 2017; Machado, 2022). While the work context frames the assigned expatriate considerably and limits discretion, the case of self-expatriation is different – and often not considered explicitly or carved out sharply (Andresen et al., 2014). Self-initiated expatriates are people who undertake international experience often without any (organizational) sponsorship. Given the lower level of support, there is much more discretion in what they do – including founding a company (Suutari & Brewster, 2000; Peltokorpi & Froese, 2009).

Notably, the literature is very much aware of assigned expatriation and is more silent in case of self-expatriation (Andresen et al., 2014; Machado, 2022). As the constellation of self-expatriated technology entrepreneurs deviates largely from assigned expatriation – e.g., by a shifted focus from human resource management to entrepreneurship research – this context allows generating new research insights.

The first set of peculiarities stems from the self-expatriation status (Andresen et al., 2014) and relates to longer-term stays and respective embeddedness in the host country, the strong impact of personal motives on their activities, the ambiguous question whether a later repatriation occurs at all, and the official status of their host country stay (Al Ariss, 2010; Banai & Harry, 2004; Andresen et al., 2014). The second set of specific features rests on the international background. On this note, crossing national and/or cultural boundaries and coping with a typically more unfamiliar host country context (e.g., language, habits, practices, rules) are the core challenges self-expatriated technology entrepreneurs face (Al Ariss, 2010). This may cause serious orientation and information problems (Machado, 2022) and goes along with liabilities of foreignness (Nachum, 2003; Politis, 2005), particularly if the individuals are self-dependent. Finally, the third set of factors relates to the ‘techpreneurship’ background that requires technological orientation, knowledge, and skills as well as absorptive capacity (Zahra & George, 2002) and reliable partners (Liao & Welsch, 2003). Technology-based entrepreneurs can transform the expatriation experience via exploitation or exploration (Politis, 2005). In case of exploitation, the stable behavior becomes the

dominant state of the learner, while exploration implies that individuals learn from experiences by exploring new possibilities (Politis, 2005).

Mirroring this profile of self-expatriated technology entrepreneurs against core constructs of organization and management theory reveals particularly four challenges founders have to cope with. (i) Bounded rationality (Simon, 1991) reveals the limited information with follow-up problems like opportunistic behavior due to limited familiarity with the foreign country and/or culture context. Minniti and Bygrave (2001) add with respect to entrepreneurial learning the myopic foresight of entrepreneurs. (ii) Liabilities of foreignness are an additional burden for self-expatriated technology entrepreneurs as they operate in foreign markets (Nachum, 2003). This holds for (iii) liabilities of newness as well as the entrepreneurs play new roles, need to interact purposefully in an unfamiliar setting and to build relationships (Stinchcombe, 1965; Freeman, Carroll & Hannan, 1983). Moreover, (iv) bounded reliability relates to the potential failure of actors to meet their commitments, due to opportunism, benevolent preference reversal, and identity-based discordance (Verbeke & Greidanus, 2009). Bounded reliability is a dual challenge for self-expatriated technology entrepreneurs as business partners may doubt their reliability and be reluctant in case of collaboration. Besides that, entrepreneurs often do not know well enough how to identify reliable partners. Identifying and building specific competencies appears to be the response to these challenges that modern business theory favors (Teece, 2007).

The first publications on 'techpreneurship' pointed to the dependence on competencies when it comes to the creation and development of technology-based businesses (Yitshaki & Kropp, 2016). While in general, entrepreneurs need technical, practical, managerial, and personal skills (Hatthakijphong & Ting, 2019), technology-based entrepreneurs also need competencies associated with innovation and creativity (Baradaran et al., 2019; RezaeiZadeh et al., 2017). Accordingly, the literature identifies entrepreneurial and managerial competencies to develop a technology-driven business and to respond to the challenges of bounded rationality/reliability and liabilities of newness. Moreover, self-expatriation calls for specific international competencies to cope with the liabilities of foreignness. The following sub-sections portray research on both categories.

Entrepreneurial and managerial competencies

Entrepreneurial competencies are a "specific group of competencies relevant to the exercise of successful entrepreneurship" (Mitchelmore & Rowley, 2010, p. 93) and relate to an "individual's potential action capacity

involving cognitive, behavioral, attitudinal, volitional and social abilities needed to perform successfully the role of the entrepreneur” (Peltonen, 2015, p. 494). Among several taxonomies for entrepreneurial competencies (e.g., Man, Lau, & Chan, 2002; Lans et al., 2010), Edwards-Schachter et al. (2015) point to the complexity of the entrepreneurial competencies and structure it along personality traits (‘who the entrepreneur is’) and behavior (‘what entrepreneurs do’) as well as insights from social cognitive interactive theory (‘how entrepreneurs act in interaction with their environment’). While the first-factor category is subsumed under trait-based skills, the latter two categories are addressed as action-based skills.

Trait-based skills. Research regards to motivation and independence (Dinning, 2019; Mets, Kozlinska, & Raudsaar, 2017) as well as proactivity (Man et al., 2002) to identify, develop and exploit business opportunities and markets. While these factors allow entrepreneurs to gain entrepreneurial momentum, other studies show the need to take risks and to tolerate ambiguity regarding the information challenges based on self-confidence, resilience, and determination (Kyndt & Baert, 2015; Bacigalupo, Kamyliis, & Punie, 2016; Komarkova et al., 2015; Moreno, Muñoz, & Morote, 2019). Both groups need to be intertwined, as venture development is typically no linear and straightforward process. These profile elements may allow ‘techpreneurs’ to move into new businesses and change directions in case of market resistance while maintaining psychic strength.

Action-based skills. Entrepreneurs need to develop the ability to persuade and convince others (Chell, 2013; Kyndt & Baert, 2015; Mitchelmore & Rowley, 2010; RezaeiZadeh et al., 2017) and to build networks through relational skills (Chell, 2013; Kyndt & Baert, 2015; Tittel & Terzidis, 2020). ‘Techpreneurs’ need particular skills of opportunity seeking given their technologically innovative solutions, capitalizing on their creativity, and a related technology absorptive capacity (Santandreu-Mascarell, Garzon, & Knorr, 2013; Weng, Chiu, & Tsang, 2022; Dinning, 2019; Moreno et al., 2019; RezaeiZadeh et al., 2017; Scuotto et al., 2022).

The literature is very strong in detailing the required skills in entrepreneurial and managerial regards (Man et al., 2002; Komarkova et al., 2015; Baradaran et al., 2019; Surdiman & Siswanto, 2020). Anyway, to successfully develop technological ventures, the alignment of specific skills comes to the fore. Ranging on a meta-level, entrepreneurial learning – as an experiential process in which entrepreneurs develop knowledge through experiencing, reflecting, thinking, and acting (Politis, 2005) – helps ‘techpreneurs’ transform experience and skills into entrepreneurial development (Scuotto et al., 2022).

The role of entrepreneurial learning in developing technological competencies is undisputed (Secundo, Schiuma, & Passiante, 2017). For ‘techpreneurs’, the emphasis on experiential learning is of great importance, as technological development rests much on experimentation and ‘moving back and forth’ (Politis & Gabrielsson, 2009). Anyway, more specific modes allow entrepreneurial learning. Besides the explicit failure-based mode that rests on replacing former beliefs through making mistakes and reflection, entrepreneurial learning by habits is under-represented and needs attention, particularly in the case of knowledge- and technology-intensive ventures (Politis & Gabrielsson, 2009; Cannavacciuolo et al., 2017). This mode of entrepreneurial learning rests on situated learning and cognition, where new knowledge emerges as a by-product of the interaction of the ‘techpreneur’ and peer-based learning (Cannavacciuolo et al., 2017).

International competencies

Self-expatriated technology-based entrepreneurs operate in an international market and, thus, utilize international and intercultural competencies (Bai, Johanson, & Martin, 2017). The literature paints a detailed and colorful, yet highly fragmented, picture of the content of international competencies.

Johnson, Lenartowicz, and Apud (2006) stressed cross-cultural competencies and defined them as “(...) the effective cross-cultural interaction in drawing upon a set of knowledge, skills, and personal attributes in order to work successfully with people from different national cultural backgrounds at home or abroad” (p. 530). They introduced a cross-cultural competency model in international business that considers (a) personal attributes as values, beliefs, norms, and personality traits (flexibility, perseverance, self-efficacy), (b) personal skills as abilities and aptitudes, and (c) cultural knowledge. Cultural distance and institutional ethnocentrism can moderate the effect of these elements on the cross-cultural competencies. In this perspective, cross-cultural competencies can be improved, and individuals can develop cultural intelligence, that is “(...) a person’s capacity to adapt to new cultural settings based on multiple facets including cognitive, motivational and behavioral features” (Earley, 2002, p. 271). In terms of outcome, Vandor and Franke (2016) found that international and cross-cultural competencies could increase an entrepreneur’s ability to recognize opportunities by facilitating the application of cross-cultural knowledge for the discovery of opportunities and creative recombinations. Kloosterman (2010) adds that developing cross-cultural capacities allows technology-based entrepreneurs to reflect home- and host-country contexts for the development of innovative technological solutions based on embeddedness in different country contexts.

Moreover, there is much research on international competencies with an accent on interpersonal and communication skills (Wang et al., 2014) as well as managing (international) networks (Coviello & Cox, 2006; Schweizer et al., 2010; Burmeister et al., 2015; Cahen & Borini, 2020) with the entrepreneur in the central position. This type of competencies is important for managing stress in international work settings (Wang et al., 2014) and as an opportunity to seek behavior for knowledge transfer worldviews (Chang, Gong, & Peng, 2012; Leung, Ang, & Tan, 2014).

METHODOLOGY

Given the early state of research and the complexity of the research topic, this step of advancing research sets an accent on explorative research. As the specific state of self-expatriated technology-based entrepreneurs is largely unknown, a deeper dive into related venture settings allows the recognition of new skill structures and constellations, as well as to better understand the complex nature of competencies and related beliefs of technology-based expatriate entrepreneurs. To this end, this study rests on several methodical decisions. (i) Due to the idiosyncratic nature of beliefs, a social constructivist position is able to reflect that – and is consequently chosen. (ii) In this vein, as interpretation matters and interpretive approaches seek to understand how and why individuals could come “(...) to behave more or less uniformly and predictably according to social customs and expectations” (Packard, 2017, p. 541), the study rests on interpretivism. This allows one to address questions about “how social experience is created and given meaning” (Eisenhardt & Graebner, 2007, p. 28). (iii) A qualitative exploratory multiple case theory-building approach is useful to analyze the development of competencies during expatriation and to consider the contextualization of the experiences. As it offers an effective way to analyze the topic in depth (Eisenhardt, 1989), this study is based on this research approach.

Case selection and sample

The multiple case theory-building approach emphasizes careful case selection (Eisenhardt, 2021). In this study, the focus is on the typology of technology entrepreneurs provided by Ratinho et al. (2015) and Majdouline et al. (2022). Moreover, we selected self-initiated expatriate ‘techpreneurs’ that moved from western-to-western countries because studies between western cultures are still scarce in the literature (Brzozowski et al., 2017). To study or to work was also among the criteria of case selection, following Qin

and Estrin's (2015, p. 227) definition of expatriates as "people that pass some time studying or working in another country". Another selection criterion was a minimum stay of four months in the host country. Four months was considered the minimum time of influencing competencies and to distinguish expatriation from other shorter international experiences. In addition, we considered a self-initiated expatriate was an individual that made the decision to go abroad on his/her own initiative (Cerdin & Semler, 2014).

We searched the maximum variation sampling on cases about the same focal phenomenon in purposefully different settings (Eisenhardt, 2021). In this study, the cases are from different origin countries: Brazil, Mexico, Germany, and Israel, and regarding different country destinations, namely Spain, United Kingdom, United States, Germany, Ireland, Turkey, and the Netherlands. The participants were identified with the support of business incubators and universities located in Brazil and Germany.

This adopted strategy led to the identification of twelve individuals to participate in the study. This sample size is in accordance with Stake's (2006) and Eisenhardt's (1989) parameters. The exact number may rest on pragmatic factors like data availability, cognitive limits, and time (Eisenhardt, 2021).

Data collection: Instruments and procedures

For the sake of data gathering and triangulation, data for this research stems from interviews and secondary sources (documents such as books, websites, and videos). This set of data provided an understanding of technological projects and undertakings in their historical context, as well as the apprehension of perceptions about the skills acquired during expatriation.

The interviews, as the prime data source, comprised a narrative part to discover different facts and meanings related to expatriation experiences (Lin & Almor, 2016). The semi-structured interviews included topics regarding the technology-based venture or project and the expatriate experience, such as "Describe your project or venture," "Tell me about your expatriate experience," and "How did your expatriation experience influence your learning to start or develop your business and your technology-based entrepreneur role?" Additionally, information was gathered regarding age, time spent abroad, host and home country, and educational level.

The interviewees were previously contacted, and the researchers informed them about the research aim and obtained their consent to take part in the study. Afterwards, they signed a consent term, and the anonymity of the twelve cases, named A1 to A12, was assured. Interviews were conducted from May 2018 to January 2019 – four interviews face-to-face and eight via the online platform 'Meet.' The interview duration ranged from 40 to 60 minutes.

The innovative character of the participants' projects and the socialization of the researchers with the techpreneurs' expatriation experiences required an effort of the researchers to dive deeply into the context.

All interviews were recorded and transcribed verbatim. The transcription totaled 78 pages. After transcription, the documents were sent via email to the participants for assuring internal validity through the validation of the content. This procedure also helped coping with some language issues as some interviews were conducted in English and some in Portuguese. To ensure external and internal validity, data were collected from the self-expatriated 'techpreneurs' and complementary sources of data.

In addition, full access electronic documents were collected from entrepreneurs, including brochures, videos, project plans, books, and online reports. Furthermore, enterprises web pages helped complement the business description. The information in these documents was transformed into handwritten notes to support the description of the projects/companies and to improve the contextual understanding.

Reliability issues were considered using a research protocol (Tranfield, Denyer, & Smart, 2003), containing the following elements: research question and objective, theoretical bases, case selection criteria, data collection, and analysis.

Data analysis

The integration of data from different sources rested on collecting and analyzing content from the different sources separately via content analysis in the first step to look for patterns and themes. Prior to analyzing the data, both researchers checked the transcripts. After transcribing the data collected from the interviews and other data sources, we started the data analysis. Data were organized in the within-case and cross-case analysis (Stake, 2006). Based on this, data were coded using Nvivo software.

Data were inductively coded with line-by-line and segment-by-segment coding methods. The coding took place by establishing analytical codes for each interview (Flick, 2009), and the coding summary report resulted in 44 pages. Codes were grouped in three categories established in accord with the literature.

The competencies derived from the expatriation were then categorized as (i) entrepreneurial competencies, (ii) knowledge and innovative competencies, and (iii) international competencies. This selection was guided by the literature review and adjusted by the researchers, in a constant discussion process. The final data analysis followed a constant comparison to find common patterns across the cases to enable the categorization

(Eisenhardt, 2021). Table 1 presents the syntheses of codes and categories. The first-order codes stem from the perceptions that participants expressed in the key topics in the interviews. The second-order codes resulted from the grouping of the first-order in accordance with the literature.

Table 1. Codes and categories

Main elements (1st order)	Codes (2nd order)	Categories (3rd order)
To find friends; investors and strategic persons. Social Networks, Business Networks, international networks. Open minded; Proximity with people. Capacity to convince others - People and Investors. To be Open and Talkative	Relational and Networks	Entrepreneurial competencies
From overcome expatriation barriers.	Behavioral/ Resilience	Entrepreneurial competencies
Patient for adaptation process and to start a business in another country	Behavioral/Patience	Entrepreneurial competencies
After overcome new language, new traditions.	Behavioral/ Trustful-Self-confident	Entrepreneurial competencies
Try new thing. Go out of the comfort zone.	Behavioral/ Proactivity and Motivation	Entrepreneurial competencies
Learning about process to start business in several contexts, vision, difficulties, and challenges.	Doing business in several contexts	Entrepreneurial competencies
New ideas; new technological possibilities and technological solutions.	Creativity	Knowledge and innovative competencies
New Methods – Managerial and Techniques.	Learning New Techniques	Knowledge and innovative competencies
International innovation mindset: start-up culture, accelerators, business plan, several places	International Innovation Environment	Knowledge and innovative competencies
Another way of life, another way of doing things, world like a huge international company.	Acceptance of different cultures	International competencies
With bad things: gangs, crimes, flaws and good things. Different values.	Perception of different cultures	International competencies
Social identity, technological world, the same happens in several places. No bridges.	Sense of international Community	International competencies
Cultural business learning, sense of comparison among countries, learning about institutional, social and corporate culture.	Multicultural Learning	International competencies

RESULTS

This study rests on twelve self-expat cases in different destination countries. This results section presents the participants' views about the development of competencies during the expatriation and the relationship between these competencies and expected entrepreneurial practices. Table 2 displays the data on participants and expatriation experiences.

Table 2. Profile of the participants and experiences

Case	Nationality	Age	Activity/ Profess.	Project or business	Destination	Duration of expat.
A1	Brazilian	50	Professor/ startup	Company in dermatoglyphics. He developed a digital process to read the dermal papilla	He has a doctorate in Health Sciences and spent four months as a postdoctoral researcher in Spain	4 months
A2	German	51	Professor/ startup	He came back to Germany and started a business in artificial intelligence	He went to the United Kingdom to pursue his doctorate	5 years
A3	Brazilian	32	Consultant	He works with large digital companies in San Francisco as a consultant in technology	He went to the United States to work with large companies	2 years
A4	Brazilian	30	Informatics	He is working in a project related to digital payments	He went to Berlin to work in a co-working space to develop new products	5 months
A5	German	27	Professor/ Startup	She created a startup, a personal digital assistant for sustainable consumer behavior	She went to the United States because of her job in a company	5 months
A6	German	26	Professor/ Startup	He created a startup, a personal digital assistant for sustainable consumer behavior	He went to the United States for an internship	4 months
A7	Brazilian	34	Business creator	Several projects related to innovation and urban properties	He went to the Netherlands to work in an accelerator company in Amsterdam	2 years
A8	Brazilian	34	Entrepreneur	Technological products for dentists	He went to the United States to discover new markets for his company, which operates in the area of equipment for dental use	4 months

Case	Nationality	Age	Activity/ Profess.	Project or business	Destination	Duration of expat.
A9	Mexican	30	Entrepreneur	Logistics Technology Company	He went to Germany for a Masters in Logistics and founded a Logistics Technology Company	4 years
A10	Brazilian	34	Mechanical Engineer	Consultant in aircraft projects	He went to Ireland to work as a consultant in aircraft projects	18 months
A11	Brazilian	38	Computer Student	Business project for cultural institutions, creating digital platforms to visitors in cultural institutes	Doctoral Student in Informatics in Germany	14 years
A12	Israel	36	Entrepreneur	Digital instruments on the web	He moved from Israel to Munich to continue the business he started in Israel	6 years

Four participants already had previous expatriation experiences (A4, A5, A10, A11) and two participants had already previously visited the country of destination (A1, A3), while the remaining participants arrived at the destination for the first time. One of them (A12) arrived in a city and then moved to another one in the same country. The motivation to go abroad differs largely. Many of them relocated to study abroad (A1, A2, A5, A6, A11). Others decided to go abroad to get more involved in another technological domain (A3, A10). Only one self-initiated expatriate decided to relocate to work for an international business incubator (A4) and another one for a business accelerator (A7). In turn, A9 went abroad to start a technology-based business, while A12 continued his technology-based business in another country. A8 went abroad to search for a market to commercialize the technological products of his enterprise. Most of them evolved in technological fields during the expatriation (A1, A3, A4, A7, A9, A10, A11, A12). One participant had a technological business before the expatriation (A8) and three of them started their technological-based business after the expatriation (A2, A5, A6).

The characterization of expatriation experiences

In the analysis of the expatriation process, we distinguished four steps: (a) arrival in the destination country and initial process of socialization, (b) engaging in activities that allowed getting familiar with the culture of the

destination country, (c) the gradual comprehensive understanding of the new context, and (d) comparisons between the home and destination country.

As for the arrival in the country of destination, the interviewees reported that many difficulties were related to their unknown situation, namely gathering information, getting orientation and access to the culture, including an understanding of local values, and overcoming language barriers. One interviewee reported financial difficulties in the beginning and another one problems with the time zone. The expatriation challenged them to interpret different kinds of events (Drori, Honig, & Wright, 2009). Four participants argued that they faced cultural prejudice (A7, A8, A9, A11). In addition, five interviewees reported difficulties in adapting to language (A7, A8, A9, A10, A12), and two participants cited a cultural shock (A3, A5). Like the difficulties of assigned expatriates in multinationals, in this research, the self-expatriate faced adaptation problems in the initial process. The cultural shock means an “emotional and psychological reaction to the confusions, ambiguity, value conflicts, and hidden clashes that occurs as a result of fundamentally different ways of perceiving the world and interact socially between cultures” (Solomon, 1994, p. 58).

To cope with the initial challenges, several respondents started building networks (A1, A3, A4, A7, A9). In most cases, the entrepreneurs were embedded in institutional contexts (universities, enterprises, incubators, accelerators), which helped them to acquire institutional knowledge gradually. Four participants highlighted the support received from business accelerators (A4, A5, A7, A9).

Gradually, they started to understand the new context and the way of doing business in the destination country. Some of them reported comparisons between the destination and the home country (A5, A10, A11). For instance, the entrepreneur who left Mexico and went to Germany said that he had discovered that in Germany, just like in Mexico, there were gangs, crimes, things that he thought would never exist in Germany. In a similar vein, A11 stated, “Germans are fallible.” Moreover, A5 mentioned a few differences in terms of formal and informal culture (A5), and A11 reported differences related to time and environment. Additionally, A2 mentioned differences between expressive and reserved cultures.

The results can be compared to the Black and Mendenhall (1990) curve of cross-cultural adjustment. They described the initial moment of expatriation as a honeymoon, when expatriates express enchantment in the destination country. After this, they have a cultural shock; from the moment they begin to realize that there are imperfections in the destination country. Then, they enter the gradual adjustment stage and, finally, the biculturalism stage.

However, the bi-culturalism stage is hard to achieve and was not observed in this research.

Beliefs about the competencies developed in expatriation

This section reveals the categories of competencies enhanced during the expatriation experiences. Based on the inductive procedure, three different categories emerged.

Entrepreneurial competencies

The analysis of interviews conducted with the self-expatriates revealed three themes with regard to entrepreneurial competencies. These competencies are: relational competencies, including communication skills and network management, behavioral competencies, encompassing trust, self-confidence, patience, resilience and proactivity, and competencies related to learning about doing business in different contexts.

Relational competencies

Three entrepreneurs mentioned that relational competencies arose from the need to cope with the unknown during expatriation. A12, for example, argued that he was compelled “to communicate better.” Another participant expressed the need for communication to convince investors. He talked about learning and improving the pitches:

My first pitch differs a lot from my pitch today, I was more technical, speaking a lot, like about data science and languages, and now I realize what investors are actually about, they always are about numbers, you must make them believe in your idea, so you must be a kind of business showman as well (A4).

In addition, three respondents (A2, A5, A9) expressed that expatriation influenced them to become more “open and talkative” persons. Some interviewees argued the importance of *network skills* in several contexts: social, business, and international. For instance, A9 mentioned that expatriation requires dealing with the unknown, which leads to a “natural way” of building networks. A3 emphasized the technological background, highlighting its very dynamic nature, and added: “Talk as much as possible to several people, because everyone has their own contacts” (A3). Participants developed networks from different sources, such as universities, venture

capital meetings, innovation hubs, and technology companies. According to some interviewees, the information obtained from the networks was important to improve their research and professional careers (A1, A3, A7), to legitimize business ideas (A1, A3, A4) and “to add value to my career and to my knowledge” (A7). A1 argued that expatriation contributed to building international partnerships for his business.

This group of competencies evidenced that the entrepreneurs improved their social abilities. Social abilities are required for the entrepreneurial role (Edwards-Schachter *et al.*, 2015; Peltonen, 2015). Communication capacity included the interaction with investors, which is relevant as venture capital plays a significant role in financing innovation and technology-based businesses (Lerner & Nanda, 2020). Additionally, according to the data, interviewees mentioned the ability to build networks, which is essential for internationalization processes (Johanson & Vahlne, 2009). According to three interviewees (A1, A3, A4), networks were relevant to legitimize business ideas and this can be related to the entrepreneurial learning, specifically in recognizing opportunities and coping with the liabilities of newness (Politis, 2005). Furthermore, business ideas are fundamental insights in the innovation field and the evolution of the business idea is a process according to the following stages: generation and enrichment of ideas, sources of ideas, evaluation and selection of ideas, storage of ideas and sharing of ideas and management of ideas (Teza *et al.*, 2016). Several participants underscored the role of institutions in this process of the evolution of the business idea, like hubs, universities and incubators.

Behavioral competencies

Two interviewees reported that expatriation improved their trust and self-confidence. A12 expressed a variety of perspectives: “I find the power again, today, now in a different situation to do the same ... facing emergencies abroad, all those things that make you grow up, and become surer, more responsible, more thinking for yourself” (A12). Another interviewee argued: “Today I feel more self-confident about talking to people because if you are alone and go to another country you do not know how to deal with this situation” (A5).

Six participants argued they become more resilient (A1, A2, A5, A9, A11, A12). Two participants (A2, A9) also highlighted the effect of expatriation on their patience. A9 mentioned that resilience was developed when he was struggling to start and develop a business in the foreign country. Additionally, A2 commented that the expatriation made him act much more proactively.

These behavioral traits are mentioned in the entrepreneurial behavior literature, like proactivity, self-confidence, and resilience (Man et al., 2002; Bacigalupo et al., 2016; Komarkova et al., 2015, Moreno et al., 2019). However, it was expected that the self-expatriation, as a challenge experience, would enhance the ability to face uncertainty and to be tolerant of ambiguity (traits cited by Grichnik et al., 2017; Kyndt & Baert, 2015), yet the interviewees did not refer to these aspects.

Learning to do business in different contexts

In most cases, the informants reported that expatriation helps them develop a vision of how to do business in several contexts. They compared the ease or difficulties of starting a business in different contexts (A2, A3, A4, A9, A12). A8 commented on comparative ethical aspects of doing business in different countries. Another aspect, mentioned by A2, A3, A4 and A7, was the agility to create a technology-based company in some contexts.

At the same time, expatriation enhanced their knowledge of how to do business in different cultural contexts. Although entrepreneurial and international competencies classifications did not mention this skill, the environmental dimensions in international business must be weighted in carrying operations to foreign markets and selecting partnerships to foreign operations (Sethi & Guisinger, 2002). This learning is also important because bounded reliability is a dual challenge for self-expatriated technology entrepreneurs, as business partners may doubt their reliability and be reluctant in the case of collaboration (Verbeke & Greidanus, 2009).

In summary, for the entrepreneurs the expatriation influenced the development of several entrepreneurial and behavioral competencies. Table 3 shows the number of codes by case.

Table 3. Number of codes by cases with reference to entrepreneurial competencies

Theme/Cases	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	Total
Relational competencies	4	3	1	3	1	1	1	0	2	0	0	1	17
Behavioral competencies	1	2	1	2	2	0	1	2	2	0	1	2	16
Learning about doing business in different contexts	2	3	3	1	0	0	1	3	2	0	2	3	20

Table 3 shows that only one participant, A10, did not mention the learning of entrepreneurial competencies. In terms of total codes, learning about doing business in different contexts was the one that reached more codes, but three participants did not express this learning. In addition, the results provide insights that expatriation improved their innovation and knowledge competencies, as will be described below.

Knowledge and innovative competencies

As Table 4 shows, the second category, knowledge and innovative competencies, comprises three sub-categories, namely creativity, learning new techniques, and international innovation environment. The innovation capacity is closely related to creativity (Freiling, 2009).

Table 4. Codes by case with reference to knowledge and innovative competencies

Codes/Cases	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	Total
Creativity	0	1	0	1	0	0	0	1	0	0	0	1	4
Learning new techniques	0	0	1	2	0	0	2	0	1	1	0	0	7
International innovation environment	0	0	0	1	0	0	0	0	1	0	0	0	2

The most cited sub-category was learning new techniques (seven mentions) with relevance to five cases. Four participants mentioned creativity and two participants mentioned the international innovation environment. Cases A1, A5, A6 and A11 did not express learning of knowledge and innovative competencies. The creativity was expressed in new ideas and open-minded behavior. One interviewee argued that expatriation contributed to him coming up with new ideas (A4). Two respondents outlined that they had become open-minded individuals. Talking about this issue, interviewees expressed:

When you are abroad, what happens is that you open your mind and when you open your mind, there are many times things that come, solutions come, not in the way, it thought they come, but it came because you are open to try to something else or to see another point of view (A12).

When we see new and different things out there, no doubt, it opens a range of possibilities, not just creativity, the international ones you end up becoming a more creative person (A8).

The second sub-category, the learning of new techniques, was observed in five self-expats cases (A3, A4, A7, A9, A10) that argued the learning of different methods and technical procedures (design thinking, technology). Regarding design thinking, this allows entrepreneurs to recognize situations and give intuitive responses (Mosely, Wright, & Wrigley, 2018). Knowledge is important for technology-based entrepreneurs. However, they did not cite issues such as intellectual property, artificial intelligence, and transfer of technology. One participant expressed that expatriation provides new ideas and not innovation, as he explained:

I think that it is more, I think about curiosity in terms of innovation because in innovation is always the exception, you know like creating a rocket or like the artificial intelligence machine or something that it is exceptionally in my view, there is like one case on a million. However, in lower level, lower tech innovation, it is always something that you're accept that have a little bit improvement. I think that is more about being active about the topic that you are working. If it is a logistics, living logistics and talking about logistics every day, working logistics every day, and then you find ground to innovate a little bit and maybe it takes being an expat limits you because you can expose to more ideas. I know how start here in Germany and in Mexico and in US opened my mind, but I do not know if it is necessary being an expat for being doing innovation (A9).

However, some learning regarding new knowledge and innovation was mentioned by participants and this may contribute to their role of technology-based entrepreneurs (Baradaran et al., 2019; RezaeiZadeh et al., 2017) to their exploration and exploitation capacity (Politis, 2005). Moreover, participants highlighted the enhancement of academic (A1, A2, A5) and ecological competencies (A5), which can enable, create and capture value for their enterprises or projects (Bailetti, 2012).

Regarding the third sub-category, two entrepreneurs (A4, A9) stated that expatriation contributes to providing an international view of the innovation environment and the international innovation hubs, such as Singapore and London:

If I start in Singapore and get like really amazing because are there investments, people are going there, only like to create something or all over the world, Singapore is really international country already! That is what is happens in Berlin. (A4)

These findings suggest that expatriation was an experience that improved creativity, supported learning new techniques, improved the innovative thinking of participants (Morad, Ragonis, & Barak, 2021) and promoted some form of inclusion in the international innovation community.

International competencies

The third category comprises the international competencies with three sub-themes: acceptance of different cultures and multicultural learning, the sense of an international community and an international innovation culture. Table 5 portrays these sub-categories.

Table 5. Code by cases with reference to international competencies

Codes/Cases	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	Total
Acceptance of different cultures/ multicultural learning/ Perception of cultural differences	0	2	0	2	4	1	1	0	3	1	2	1	17
Sense of international community	1	1	0	1	1	0	1	0	1	1	0	1	8
International Innovation Culture	0	0	1	1	0	0	1	0	0	0	1	0	4

The cultural dimension of learning unites the general cultural knowledge – a focus on awareness and knowledge of cultural differences – and the culture-specific knowledge – (Johnson et al., 2006). For instance, in the code named “the acceptance of different cultures, perception of cultural differences and multicultural learning,” A9 pointed out that during expatriation, getting in touch with cultural differences was important. Another interviewee reported that: “Germany opened my eyes. (...) it is an open society that accepts people” (A12). In general, participants mentioned that the knowledge of different cultures was an important influence on the expatriation experience.

The cross-cultural experience was also a challenge for them and required coping with an unfamiliar host country context (language, habits, and practices) where liabilities of foreignness occur (Al Ariss, 2010; Nachum, 2003; Politis, 2005):

This is something that I find very difficult, because many times I was unable to express myself and really try to speak German. I start in German, but you know, as foreigner, sometimes you need to use your English because, of course, when you don't speak correct, but then you start to speak and you get back just silent: "*hier wir sprechen Deutsch*". This is very exhausting to get this back, so this is something that was very difficult to me and I had many times shock (A12).

Germans are very welcoming and accepting, but when you have to do business with them, there is also another culture, they are closed and talk a little bit and they have to judge in how you look, how you speak, what you looking, yes that is something else from doing business here (A9).

You are in Germany you must understand what I am talking about. Communication is much more direct, much more direct to the point, less emotional, so people do not have so much question of creating relationships at work (A11).

Another sub-theme coded to relate to international competencies is the sense of (belonging to) an international community. Two participants illustrated the multiculturalism, they found in expatriation, which can be observed in the following quotes: "There was a time we had twenty-four people from fifteen different countries, so it was an international environment" (A7); "Today the project is very international, approximately fifteen or twenty people directly working, and they are not necessarily from the same place" (A10). Some participants stated that they acquired an international mindset that nurtured the feeling of belonging to an international community. This linked to the specific technological background, as some of them commented: "The expatriation makes me have an international mindset" (A2); "I feel like part of a community that is internationalized and if you go to Berlin, you meet people from all over the place" (A5).

In the international innovation culture code, four participants indicated that expatriation reinforced the idea of the culture of innovation (A3, A4, A7, A11), that is "a culture that is in all the world" (A11):

When we think of tech entrepreneurs, we have to go to the big cities, then everything is happening, also Berlin. So, you definitely have to be in Berlin from time to time, all the conferences, all the agencies are here, but it's not only Berlin, it's other cities, for example, it's clear that San Francisco, but if you really are a tech entrepreneur you feel like part of the community. (A4)

Table 6 provides an overview of competencies case by case. In all cases, at least two types of competencies matter. In six of twelve cases, all types of competencies occur. Comparing the three competencies, the entrepreneurial competencies and the international types were presented in eleven cases, respectively. Although with lower incidence, skills associated with innovation and knowledge were observed in eight of the twelve cases.

Table 6. Type of competencies by case study

Case	Entrepreneurial competencies	Knowledge and Innovative competencies	International competencies
A1	✓	✓	✓
A2	✓	✓	✓
A3	✓	✓	✓
A4	✓	✓	✓
A5	✓		✓
A6	✓		✓
A7	✓	✓	✓
A8	✓	✓	
A9	✓	✓	✓
A10		✓	✓
A11	✓		✓
A12	✓	✓	✓

The cases express the entrepreneurs' beliefs about the competencies developed during the expatriation. The three themes that emerged from the analysis are illustrated in Figure 1: (a) entrepreneurial competencies, (b) knowledge and innovative competencies, and (c) international competencies.

DISCUSSION

Competencies are relevant to technology entrepreneurs to perform their roles (Mitchelmore & Rowley, 2010). This research explored self-expatriated technology-based entrepreneurs' beliefs and experiences about the development of their competencies during expatriation. Our study has contributed to understanding the development of several competencies according to the perceptions of technology-based entrepreneurs self-expatriated: entrepreneurial and behavioral competencies, knowledge and innovative competencies, and international competencies.

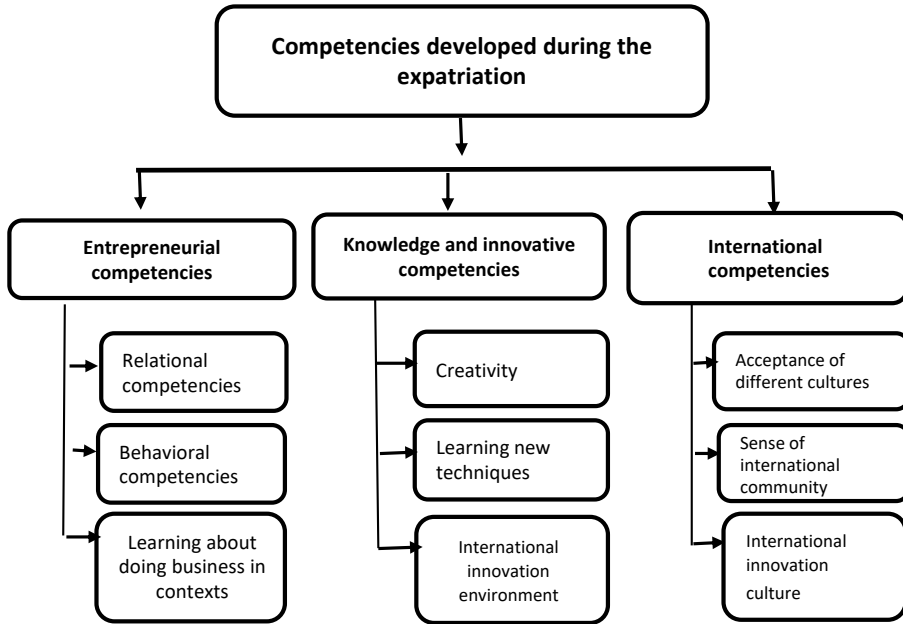


Figure 1. Map of categories related to competencies derived from expatriation according to the technology-based expatriated entrepreneurs

Entrepreneurial and behavioral competencies

Regarding entrepreneurial competencies, our findings showed three groups of competencies: communicative and relational, behavioral, and competencies on how to do business in different contexts. In the first group, the communicative and relational competencies literature highlights that they are necessary for entrepreneurs to develop specific social and business networks (Chell, 2013; Chen & Tan, 2009; Grichnik et al., 2017; Peltokorpi & Zhang, 2020). According to the interviewees, expatriation was a relevant experience to improve their relational and communicative competencies. This experiential learning enables them to expand their ideas and their business. Furthermore, the entrepreneurs stressed networks as a mechanism to overcome barriers, to expand their businesses, and as a source to obtain information, thus influencing entrepreneurial competencies (Chell & Athayde, 2009; Deligianni et al., 2019; Grichnik et al., 2017; Rasmussen, Mosey, & Wright, 2011; RezaeiZadeh et al., 2017).

Another type of entrepreneurial competencies identified is behavioral competencies. Prior studies have noted the importance of psychological or

personality traits, like self-efficacy, self-awareness and self-confidence for playing the role of entrepreneur (Bacigalupo et al., 2016; Komarkova et al., 2015; Moreno et al., 2019). The data in this research showed that expatriation increased resilience, patience, trust, and self-confidence of participants. In line with previous studies, these competencies are important for entrepreneurs not only to create or discover opportunities, but at all stages of the venture (Hansen, Srader, & Monllor, 2011; Chell, 2013). Likewise, resilient entrepreneurs show a high degree of tolerance for ambiguity and adapt quickly to change (Ayala & Manzano, 2014). Especially for technology-based entrepreneurs, resilience is necessary to adapt to changes, as well as to overcome difficulties associated with conquering markets for innovative products.

The current study found another entrepreneurial competency: the ability to do business in another context. Chang, Gong, and Peng (2012) showed that this competency can influence absorptive capacity and knowledge transfer. For techpreneurs this can increase the ability to recognize entrepreneurial opportunities and to put new ideas into practice (Qin & Estrin, 2015; Vandor & Franke, 2016). As highlighted by the Doing Business Report (World Bank Group, 2020), it is necessary to better understand the influence of cultural aspects of doing business. The participants of this research mentioned ease, difficulties, ethical aspects, and the assessment of uncertainty in doing business in different countries.

Knowledge and innovative competencies

Knowledge and innovative competencies are key issues for technology-based entrepreneurs. Our results showed that expatriation improved creativity, learning of new techniques, and developing a culture of international innovation. Previous research has found that creativity can improve the ability to become more innovative (Deligianni et al. 2019). Creativity is particularly important for techpreneurs as it can improve the ability to create opportunities and the ability to generate new ideas, and envision possibilities (Chell, 2013; Hansen et al., 2011). Technology-based entrepreneurs often operate in an international scenario that is complex, and creativity is useful to cope with these challenges. Only four participants mentioned creativity as a skill developed in the destination country. However, it is important to mention that interviewees referred to an “open minded” effect, which can nurture creativity.

In seven cases, the experience abroad allowed them to learn about different methods for new business development, such as design thinking and comparable types of advanced methods. In these settings, institutions

like universities, incubators and hubs, promoted innovation as innovator actors (Ranga & Etzkowitz, 2013).

Regarding the international and innovative identity, Peltokorpi and Zhang (2020) and Bai et al. (2017) commented that expatriation fuels the development of a cultural identity or an international mindset. Our findings show that the technology-based entrepreneurs developed cultural identity and an international innovation mindset, including a start-up culture and atmosphere in accelerators, incubators, and universities. This competency is important for providing capacity to technology entrepreneurs to invest abroad, given that they need to start businesses in several contexts (Bai et al., 2017; Fu, Hou, & Sanfilippo, 2017).

International competencies

The third group of competencies relates to the development of international competencies. Previous studies showed that technology-based entrepreneurs act in changing and complex environments (Bacigalupo et al., 2016; Johanson & Vahlne, 2009) and they need to identify opportunities in an international context (Dimitratos et al., 2016; Muzychenko, 2008). This research identified the following international competencies: acceptance of different cultures and multicultural learning, the sense of an international community, and an international innovation culture. This result adds value to the understanding of international competencies, such as interpersonal and communication skills, networking ability, adaptability, and flexibility (Cahen & Borini, 2020; Wang et al., 2014). Another interesting finding is the sense of an international identity connected to the international technological mindset. This international vision is close to a global competency that can influence entrepreneurs to see the market from a different angle (RezaeiZadeh et al., 2017). This type of competency can encourage technology entrepreneurs to start businesses in other countries and increase exports (Dimitratos et al., 2016; Paul, Parthasarathy, & Gupta, 2017). Moreover, an international mindset can contribute to the development of an international orientation, stimulating entrepreneurs to discover and develop opportunities in international markets in exploration and exploitation dimensions (Politis, 2005). The findings of this research reinforce the statement that competencies can be developed in a cognitive and learning process (Beckman et al., 2012; Chell, 2013; Edwards-Schachter et al., 2015; Mitchelmore & Rowley, 2010), where entrepreneurs learn from past experiences (Politis, 2005).

Although each expatriation experience is singular, this research with diversified cases could demonstrate that self-expatriation can nurture entrepreneurial, international, and innovative learning. Experiences abroad

require the interpretation of different types of events (Aliaga-Isla, 2014), and the challenges for self-expatriates in this research are similar to assigned expatriates. They need to face a cultural adjustment (Black & Mendenhall, 1990); meanwhile, this circumstance did not prevent learning from experience. Nonetheless, our results show that innovative competences were the least highlighted by participants.

CONCLUSIONS

The aim of this research was to explore self-expatriated technology-based entrepreneurs' beliefs and experiences across expatriation to seven destination countries to identify enhancement of their competencies. Findings evidenced that self-expatriation enhances competencies of technology-based entrepreneurs. As an intercultural experience, it provokes learning processes (Terjesen & Elam, 2009) by exploring new contexts and possibilities (Politis, 2005).

This study makes, at least, three main contributions to research. First, the study stresses and specifies the cognitive dimension of self-expatriated technology-based entrepreneurs. This adds to the still rather limited knowledge on self-expatriated entrepreneurship (Andresen et al., 2014; Machado, 2022) and allows a deeper understanding of how self-expatriation is a source of entrepreneurial learning (Politis, 2005), linking entrepreneurial competencies (Chell, 2003), international and intercultural competencies (Johnson et al., 2006; Leung et al., 2014), and innovative competencies (Chell, & Athayde, 2009). Second, the findings contribute to a more nuanced understanding of the process of self-expatriation of techpreneurs and suggests a four-step approach with (a) the arrival in the destination country and initial process of socialization, (b) the engagement in activities to familiarize with the culture of the destination country, (c) the understanding of the new context, and (d) the comparisons between the home and destination country. This study delivers a more specific set of phases that emerges out of the data. These findings complement earlier work in self-expatriation (Al Ariss, 2010; Cerdin & Selmer, 2014; Doherty, 2013) and emphasize it in technology entrepreneurship (Matejun, 2016; Shane & Venkataraman, 2003). Third, the findings specify how self-expatriation results in the development of different competencies and detail the respective skill set, comprising (i) entrepreneurial competencies; (ii) knowledge and innovative competencies, and (iii) international competencies. (i) As for the entrepreneurial competencies, our study goes beyond the integration of technology and business skills relevant to the implementation of technology-based enterprise (Matejun, 2016; Mosey et al., 2016) and sheds

light on technical training, the considerable opportunities for entrepreneurial learning and – building on Mitchelmore and Rowley (2010) and Peltonen (2015) – to emphasize entrepreneurial skills in the light of expatriation and the to date rarely focused technology-based entrepreneurs.

Furthermore, our findings stress relational and behavioral aspects of entrepreneurial skills in line with previous studies (Dinning, 2019; Man et al., 2002; Komarkova et al., 2015), but emphasize the competence of how to do business in the specific context. (ii) Regarding knowledge and innovative competencies in self-expatriation experiences, previous studies emphasize scientific and technological knowledge (Bailetti, 2012; Beckman et al., 2012; Shane & Venkataraman, 2003), while our findings reveal the ability to act in the international innovation environment an additional innovative competency. (iii) Regarding international competencies, technology-based entrepreneurs face the challenge of bounded reliability (Verbeke & Greidanus, 2009) and liability of foreignness (Nachum, 2003; Politis, 2005). Enhancing international competencies may help them to overcome these obstacles. The findings of this research go beyond the existent literature that emphasizes the personal attributes, cultural knowledge, and networking skills (Johnson et al., 2006; Burmeister et al., 2015; Coviello & Cox, 2006; Schweizer et al., 2010). According to our findings, the self-expatriate technology-based entrepreneurs perceive a sense of international community and they learned about the international innovation culture.

Furthermore, this study focused on the process of self-expatriation to understand the learning process of entrepreneurs rather than the results. Our results demonstrate that self-expatriation represents an opportunity for technology-based entrepreneurs to learn a wide range of different competencies that contribute to innovating, to managing their business and operating in international markets.

The findings of this study have several practical implications. Competencies are critical for technology entrepreneurs and our findings bring elements to entrepreneurship education programs aimed at technology entrepreneurs, pointing at entrepreneurial, innovative, and international aspects. Furthermore, considering the favorable effects of expatriation experiences, as well as the reported difficulties of the interviewees, the results show the importance of offering institutional and policy support for technology-based entrepreneurs who aim to have expatriation experiences.

International exchange programs for students in technology-based courses in universities could implement international programs for students intending to start a technology business. Finally, government and society should promote insights into innovation policies that consider expatriation

experiences in innovative environments such as technology incubators and science parks.

Among the limitations of the study, the cases covered only the following countries of origin: Brazil, Mexico, Israel, and Germany, and the following destination countries: Spain, the United Kingdom, the United States, the Netherlands, Germany, and Ireland. It is important to note that the results of this research apply to self-expatriates. Cases of assigned expatriates may show different results. Another limitation is a gender bias as only one woman is among the participants, whereas previous studies demonstrated differences in entrepreneurial competencies between women and men (Mitchelmore & Rowley, 2013).

Further studies could expand the finding of this research, understanding gender effects on competencies in self-expatriation in innovative and international context. Future research may also explore skills in self-expatriation in other types of entrepreneurs different from techpreneurs.

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Abstrakt

CEL: W obliczu luki badawczej w zakresie uczenia się przedsiębiorczości przez przedsiębiorców korzystających z technologii, którzy wyjechali za granicę, celem jest zbadanie przekonani i doświadczeń tych przedsiębiorców podczas ekspatriacji, aby zidentyfikować wzmocnienie ich kompetencji. **METODYKA:** W ramach jakościowego i eksploracyjnego podejścia do budowania teorii wielu przypadków zebrano dane od dwunastu przedsiębiorców technologicznych z Brazylii, Meksyku, Niemiec i Izraela, którzy udali się do następujących krajów docelowych: Hiszpania, Wielka Brytania, Stany Zjednoczone, Niemcy, Irlandia, Turcja i Holandii. Ponieważ głównym źródłem są dane z wywiadu, analiza danych opiera się na jakościowej analizie treści. **WYNIKI:**

*Dane pozwalają na ustrukturyzowanie doświadczeń ekspatriacyjnych przedsiębiorców technologicznych według następujących etapów: (a) przybycie do kraju docelowego i początkowy proces socjalizacji, (b) zaangażowanie w działania mające na celu zapoznanie się z kulturą kraju docelowego, (c) stopniowe kompleksowe zrozumienie nowego kontekstu oraz d) porównania między krajem macierzystym a krajem docelowym. Ekspatriacja miała wyraźny wpływ na przedsiębiorców technologicznych, który przejawia się w trzech grupach kompetencji: kompetencje przedsiębiorcze, kompetencje wiedzy i innowacji oraz kompetencje międzynarodowe. Kompetencje w zakresie przedsiębiorczości odnoszą się do umiejętności relacyjnych i behawioralnych oraz uczenia się prowadzenia działalności gospodarczej w różnych kontekstach. Jeśli chodzi o wiedzę i innowacyjne kompetencje, na pierwszy plan wysuwa się kreatywność, uczenie się nowych technik oraz międzynarodowe środowisko innowacji. Wreszcie, kompetencje międzynarodowe odnoszą się do akceptacji różnych kultur (uczenie się wielokulturowości i postrzeganie różnic kulturowych), rozwijania poczucia wspólnoty międzynarodowej i międzynarodowej kultury innowacji. **IMPLIKACJE:** Badanie to wykazało wpływ doświadczeń ekspatriacyjnych na szkolenie umiejętności przedsiębiorców opartych na technologii, w specyficznym podejściu do kompetencji przedsiębiorczych, innowacyjnych i międzykulturowych. Badanie przedstawia samoekspatriację jako szansę dla przedsiębiorców technologicznych na rozwijanie różnych kompetencji, które są pomocne w innowacjach, zarządzaniu biznesem i działaniu na rynkach międzynarodowych. Rząd może opracować politykę przyciągania samo-emigrantów do ośrodków innowacji, biorąc pod uwagę, że lokalni mieszkańcy mogą skorzystać z wymiany kulturalnej. **ORYGINALNOŚĆ I WARTOŚĆ:** Niniejsze badanie przyczynia się do lepszego zrozumienia wpływu doświadczeń związanych z własnym wyjazdem za granicę na rozwój umiejętności przedsiębiorców technologicznych. W porównaniu z poprzednimi badaniami zapewnia szerszy zakres uczenia się na podstawie doświadczeń ekspatriacyjnych poza wpływem internacjonalizacji na wiedzę rynkową i aspekty kulturowe. Co więcej, niniejsze badanie koncentruje się na procesie, a nie na wynikach samoekspatriacji, aby zrozumieć proces uczenia się przedsiębiorców.*

Słowa kluczowe: przedsiębiorcy technologiczni, innowacyjność, przedsiębiorcy, umiejętności, kompetencje, ekspatriacja

Biographical notes

Hilka Pelizza Vier Machado holds a Doctorate in Production Engineering from the Federal University of Santa Catarina, Brazil. Since 2015, she has been a Full Professor at UniCesumar University, and since 2023, she has worked as a collaborating professor at the Doctoral Program in Business Administration, Paraná Federal University, Paraná State, Brazil. Her primary research interests lie in entrepreneurship and innovation.

Jörg Freiling is Full Professor at Bremen University, Faculty of Business Studies and Economics, in Germany. Since 2001 he has held the LEMEX Chair in Small Business & Entrepreneurship (LEMEX) and from 2009 till 2021 he

was Vice Dean at this faculty. His preferred research areas are transnational entrepreneurship, immigrant and refugee entrepreneurship, entrepreneurial ecosystems and support systems, startup incubators and accelerators, business model innovation and organizational competences.

Authorship contribution statement

Hilka Pelizza Vier Machado: Contribution, Data Curation, Formal Analysis, Investigation, Methodology, Project Administration, Resources, Software, Supervision, Validation, Visualization, Writing Original Draft, Writing, Review, Editing. **Jörg Freiling:** Contribution, Data Curation, Formal Analysis, Investigation, Methodology, Project Administration, Resources, Software, Supervision, Validation, Visualization, Writing Original Draft, Writing, Review, Editing.

Conflicts of interest

The authors declare no conflict of interest.

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A phenomenological exploration of technology start-up failure in Sri Lanka

Kesara Wimal¹ , Selvaratnam Ajendra² 

Abstract

PURPOSE: The main purpose of this qualitative study was to explore tech start-up failures in Sri Lanka to emerge themes that explain the critical factors that are impacting failures of Sri Lankan tech start-ups and also to identify recommendations that could help evade those factors. The paper also presents the finding to enrich tech entrepreneurs to build their strategies with an understanding of factors that leads to failure and to make well-educated decisions. **METHODOLOGY:** The study is based on a qualitative research approach that helps to present findings in a theoretical way. A phenomenological analysis has been used to identify, understand, and analyze the phenomena of tech start-up failures. Twelve start-up leaders participated in this study and shared their lived experiences of tech start-up failures in Sri Lanka. Interviews were conducted with them based on twelve interview questions and twelve core themes emerged based on the participants' lived experiences. In analyzing data, the modified Van Kaam approach was used, utilizing a seven-step framework that considers the structural and textual aspects of experiences, as well as the perceptual characteristics of the phenomenon. **FINDINGS:** The themes answered the key research question of the study: What are the critical factors that are impacting on failures of tech start-ups in Sri Lanka? The cause of tech start-up failures according to the current study varied including, financial uncertainty, no market research, no product–market fit, paranoid behaviors of innovators, lack of timely response to changing conditions, and location of the venture. **IMPLICATIONS:** The paper concisely presents twelve critical reasons for tech start-up failures. The results of the research will enable Sri Lankan tech start-ups to identify key factors of failure for the growth of their surviving strategies. Identifying secret obstacles in the industry helps entrepreneurs prepare for pitfalls and provides guidelines for policymakers to make informed choices when implementing national policies. More importantly, it has been discovered that the major areas that require more attention are leadership, funding, marketing, and innovation. Finally,

1 Kesara Wimal, MBA, MSc in Advanced Software Engineering, School of Computer Science and Engineering, University of Westminster, London W1B 2HW, United Kingdom, e-mail: w1851993@my.westminster.ac.uk (ORCID: <https://orcid.org/0000-0002-9729-9437>), corresponding author.

2 Selvaratnam Ajendra, MBA, ACMA, CGMA, Lecturer, Global Banking School (GBS), Greenford UB6 0HE, United Kingdom, e-mail: growingajay@gmail.com (ORCID: <https://orcid.org/0000-0002-1494-768X>).

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four groups of recommendations have been discussed under financing, market research, leadership, and inventors. **ORIGINALITY AND VALUE:** The comparison of the current study themes with the findings of related studies is inconclusive because the literature on tech start-up failures in other countries and in Sri Lanka is minimal. Some of the themes align with the findings of research conducted in other countries, although there were some themes that were explored uniquely.

Keywords: entrepreneurship, tech entrepreneur, start-up failure, critical success factors, software start-up, survival strategies, technology start-up

INTRODUCTION

As a main critical driver of social and economic growth, entrepreneurship can be identified. As a result, policymakers are paying attention to entrepreneurs and new ventures. Entrepreneurs are key drivers of any kind of economy, not only because they are generating jobs but also because they create innovations (Acs, Audretsch, & Lehmann, 2013). Start-ups are coming out as the main outcome of entrepreneurship activities. Basically, a start-up is a young company set up to develop a new product or service and bring one or more entrepreneurs to the market. The traditional start-up tends to be a shoestring activity because of its essence, most entrepreneurs raise their initial capital from themselves or their friends and families (Roberts, 1990). Start-ups face high volatility and high rates of failure, but a minority of them remains effective and impactful. By providing an effective and efficient solution, most start-up founders aim to address a big pain of the current society, and most recent start-ups combine technology into their solutions (Kohler, 2016). The initial start-up phase is somewhat traditional, and they begin to develop a minimum viable product (MVP) after performing interviews and validating market requirements. The life cycle of a typical start-up is expected to be three years or a bit longer, so a sustained effort is needed while minimizing uncertainty (Birley, 1996).

There is another key term that is always coupled with the term “start-up” which is “start-up failure”. The term is clearly pessimistic but it’s important to explore why start-ups are failing because only a few scientific studies attempt to address the characteristics of failure, particularly in the early stage (Giardino, Wang, & Abrahamsson, 2014). Some eight out of ten new companies have struggled in their first three years. Nine out of ten start-ups that are venture-backed fail to yield positive returns. 99% of the pitches they see are turned down by venture capitalists (Feinleib, 2011). Most of the time start-up founders are following the glory instead of the market, which is why they are blind to understanding the hidden obstacles. Most software product businesses fail to make a worthwhile return on their financiers, founders, and

employees' investments. Failures in distribution, marketing, and delivery implementation are widely known, but failures in product creation are less evident, while in some cases, it can be the main reason (Crowne, 2002).

Tech start-ups leverage innovation and entrepreneurial creativity to bring new ideas to market. They are typically founded by individuals with innovative ideas, seeking to establish new businesses (Kalyanasundaram, Ramachandrule, & Mungila Hillemane, 2021). Sri Lanka's ICT/BPM industry led the country's service exports in 2019, with tech start-ups playing a significant role in contributing to the national economy and societal well-being. Given their crucial impact on the economy, academics and policymakers should focus on improving the conditions for tech start-ups in Sri Lanka (Samarasinghe, Sandanayake, & Samarasinghe, 2021).

The primary objective of this research is to identify, understand, and analyze the critical factors that are impacting the failures of tech start-ups in the Sri Lankan context, as well as to give a brief understanding of how to avoid such factors for future start-ups: 1) Identify the critical factors for the failures of tech start-ups in Sri Lanka. 2) Understand the lived experiences of technology start-up leaders with the causes of technology start-up failure in Sri Lanka. 3) Present the study findings to support entrepreneurs to build tech companies by focusing on success and diminishing failures.

Understanding the essence of small business failure has been an ongoing activity of researchers. The study shows that the causes of failure have changed over time (Simmons, 2007). Previous literature suggested the presence of correlations in factors affecting small business success or failure, irrespective of the time that the small business operated. Kline and Perry noticed that management abilities led to the success of small companies (as cited in Simmons, 2007).

Stinchcombe (1965) claimed that small ventures have fewer resources than more mature companies and less leadership experience managing the firm. Between 1991 and 2000, an empirical study of 11,259 technology start-ups found that 36% of technology start-ups survived the last four years, but only 21.9% survived the last five years (Song et al., 2008), resulting in severe losses to stakeholders. According to the U.S. Small Business Administration (2006), around 550,000 small businesses close annually in the United States. Collins (2005) noted that there was a correlation between sound leadership characteristics and the performance of the organization. Small business leaders face leadership challenges while launching a new business first and then expanding it (Mellahi & Wilkinson, 2004). Small business failure analysis has traditionally concentrated on external and internal causes (Rasheed, 2005). Government controls, labor competition, and the decrease in demand were external factors, while financial capital and leadership were

internal factors (Mellahi & Wilkinson, 2004). The company life cycle often affects variables that could affect the understanding of leaders during the various stages of the growth of an organization (Wheatley, 2006).

Prior research on the underlying factors contributing to the failure of small businesses has yielded inconclusive and context-dependent results, as indicated by extant literature. The examination of small business failures in Uganda (Tushabomwe-Kazooba, 2006) reveals that politics and taxes are prominent causal factors, whereas two separate studies on Indian (Goswami, Murti, & Dwivedi, 2023) and South African (Fatoki, 2014) start-ups fail to mention these aspects. The objective of the current study was to explore the variables affecting the failure of technology start-ups. The findings of the current study might add to previous research by enhancing the knowledge of the causes of technology start-up failure in Sri Lanka.

This study aims to critically analyze the factors contributing to technology start-up failures in Sri Lanka through an examination of the lived experiences and perspectives of technology start-up leaders, with a goal of supporting entrepreneurs in building successful tech companies by emphasizing crucial factors. The following research questions (RQ) are:

RQ1) What are the critical factors for the failures of tech start-ups in Sri Lanka?

RQ2) What are the lived experiences of technology start-up leaders with the causes of technology start-up failure in Sri Lanka?

RQ3) How this study can support entrepreneurs to build tech companies by focusing on the critical factors and diminishing failures?

LITERATURE REVIEW

The word entrepreneur is derived from the term “entreprendre” in French, meaning “to undertake.” The basic definition of entrepreneurship doesn’t align with current entrepreneurs’ mindset, and the modern concept also focuses on solving significant problems to enhance the world. Like creating social change or creating an innovative product that challenges the status quo on how we live our lives every day (Frese & Gielnik, 2014). The characteristic of an entrepreneur and a start-up founder is not always similar. For an entrepreneur, it is important to get paid for the effort or money he has invested. But start-up founders often do not think at first about the process of sale because they want to produce greater income in the future (Sethi, 2014).

Start-up founders are often called visionaries because of their greater vision to be successful while building something impactful to humanity. Working on technology for a start-up, or taking venture capital, or getting

some sort of “exit” is also not relevant. The only important thing is progress (Graham, 2012). A start-up is “a human institution designed to deliver a new product or service under conditions of extreme uncertainty” as Eric Ries said in *The Lean Startup* (2011).

Start-up tech companies face a very competitive market. They must offer highly creative products in the shortest time possible. Resources are limited and the time to enter the market is short, so having the right specifications is extremely essential. Nonetheless, software specifications are generally not transparent and start-ups are struggling to understand what they should build (Melegati & Goldman, 2016). Tech start-ups, operating under limited funding and facing high uncertainty, often face immense pressure. Consequently, they tend to prioritize speed to market over long-term codebase health, leading to the accumulation of technical debt (Besker et al., 2018).

Definition of start-up failure

“It’s fine to celebrate success, but it is more important to heed the lessons of failure.” (Bill Gates, n.d.) Although 50 million new ventures are launched worldwide every year, according to the European Association of Business Angels, 90% of them fail (Bednár & Tarišková, 2017). The process may have already been undertaken by many of those with the greatest entrepreneurial skills, leaving a disproportionate number of lower potential entrepreneurs next in line (Kuntze & Matulich, 2016). Some studies introduce starting a start-up as a game because of the uncertainty and required continuous effort and also most of the scholars are saying failures are the pathway to success. As start-up failure has been seen both positively (e.g., McGrath, 1999) and negatively (e.g., Dickinson, 1981). Although monetary and emotional costs express the negative effects of failure, their positive effects are less noticeable, being related to learning, experience, and other cognitive constructs (Mitchell, Mitchell, & Smith, 2004). For at least two decades, start-up failure has been a subject of research. It has been examined at many stages of analysis in one context or another, in firms (Azoulay & Shane, 2001), in organizational populations (Hannan & Freeman, 1989), in individuals (Shepherd, 2003), and in the economy (McGrath, 1999). It has been correlated with business grief (Shepherd, 2003), learning (Minniti & Bygrave, 2001), risk and reward (McGrath, 1999), and various other socio-economic phenomena (e.g., Begley & Tan, 2001). In order to gain a deeper comprehension of the factors contributing to success or failure in businesses, several types of research are available (Gaskill, Van Auken, & Manning 1993). Nevertheless, there remain numerous unresolved questions that necessitate further exploration. When

it comes to the failures of start-up ventures, previous studies have failed to provide a comprehensive or cohesive explanation (Lussier, 1996).

This study is focusing on not only start-ups but also on tech start-ups. More recent research has focused on integrating the methods of Design Thinking (DT), Lean Startup, and Agile to create and scale new products in order to specifically reduce tech start-up failures (de Paula & Araújo, 2016). In 2008, Eric Ries explored and introduced two explanations for the failures of most tech start-ups when he proposed his approach called Lean Startup Methodology, which aimed to manage high-tech start-up enterprises.

- Application of conventional management business tools, assessment of performance, construction methods, and industry inquiries. For start-ups that act in conditions of uncertainty, these traditional instruments are almost useless.
- Exactly the opposite reason: entrepreneurs begin to ignore the above instruments and all other management techniques, organizing a kind of market chaos under the “Just do it” flag, seeing that all this does not work.

Noam Wasserman’s *The Founder’s Dilemmas* (2012) emphasizes that early, relatively easy, and seemingly short-term decisions can have important long-term consequences. Hence the need to make these choices rationally, building on the knowledge of others. In the term call start-ups, the susceptible to the start-ups’ failures are created. So to prevent these futures, it is more important to consider precise explanations for start-up failures.

Causes of start-up failure

Fatoki (2014) conducted a comprehensive literature analysis on the factors contributing to the failure of new small businesses in South Africa. The findings underscored several key challenges faced by these ventures including the absence of an efficient logistics chain, exorbitant distribution costs, intense competition, rising operational expenses, and inadequate access to funding.

A case study based empirical study conducted an investigation into the reasons behind the failure of small businesses in Uganda and identified various factors contributing to the downfall of these businesses, including the absence of business plans, excessive taxes, power outages, insufficient capital, unfavorable market conditions, exorbitant rental fees, and incorrect pricing strategies (Tushabomwe-Kazooba, 2006).

Goswami, Murti, and Dwivedi (2023) explored the reasons behind the failure of Indian start-ups by conducting a narrative analysis of prominent business stakeholders. Their findings revealed that a lack of capital or

insufficient funds, along with an ineffective sales and marketing strategy, emerged as the primary factors contributing to the failure of start-ups in India.

Kalyanasundaram (2018) examined start-up failures in Bangalore and discovered key factors distinguishing failed start-ups from successful ones, including the time taken to reach a minimum viable product, revenue generation, founders' complementary skills, their personality traits, financial independence mindset, and openness to mentorship during critical stages.

Finance related failures. Successful start-ups distinguished themselves by monetizing their ideas and generating revenue within six months of their minimum viable product (MVP) launch, reinvesting profits into product enhancement, and avoiding reliance on investors (Kalyanasundaram, 2018). Investors often cause start-up failures, and while some entrepreneurs benefit from them, most cofounders resent their interference. They complain about being pressured to follow the investors' direction, including forced pivots and unwanted matchmaking (Kalyanasundaram, Ramachandrupa, & Mungila, 2021).

Leadership failures. Mistakes in management or leadership contribute significantly to the downfall of small business failure. Several prominent errors in leadership result in business failures. These include embarking on entrepreneurship for inappropriate motives, underestimating the time commitment required for business success, facing pressures from the family in terms of time and financial resources, lacking awareness of the market, failing to exercise financial responsibility, and lacking a well-defined focus (Fatoki, 2014). One of the main reasons small firms fail is a lack of effective management in the beginning (Tushabomwe-Kazooba, 2006).

Less product innovation related failures. Innovation plays a pivotal role in shaping the fate of start-ups, thus leading to the belief that the lower the innovativeness the smaller the performance (Aminova & Marchi, 2021). The primary cause behind the failure of start-ups is often attributed to their inability to achieve a suitable alignment between their product and market demands. A strong emphasis on understanding and meeting the specific needs of the target audience is crucial in establishing a successful product-market fit and increasing the chances of start-up prosperity (Cantamessa, Gatteschi, Perboli, & Rosano, 2018).

Lack of knowledge and experience-related failures. Start-up companies have a higher likelihood of failing when the team of co-founders lacks the necessary complementary skills, which is made worse by their limited collective experience. When entrepreneurs embark on a new venture without the required expertise or a balanced set of skills among them, it becomes a recipe for a disastrous outcome (Kalyanasundaram, Ramachandrupa, & Mungila, 2021). Start-ups with academically qualified founders and

a high percentage of graduate workers are more likely to innovate and perform better, as the combination of founder knowledge and workforce academic experience leads to greater identification and exploitation of new opportunities, changing the market and increasing start-up performance (Aminova & Marchi, 2021).

Start-up ecosystem in Sri Lanka

Tech start-ups mainly doing software development are one of the largest contributors to the export economy in Sri Lanka. Sri Lankan engineers are at the forefront of innovation, from electric sports cars, eBay's middleware, to powering one of the world's most successful stock exchanges. In the 2019 edition of the World Bank's Ease of Doing Business Index ranking among the top 100 (13th in Asia) among 190 nations, Sri Lanka rose 11 positions. Sri Lanka's ICT industry can increasingly concentrate on value-added ICT products that include the Internet of Things (IoT), Artificial Intelligence (AI), and Big Data. In addition, physical goods that make use of 3D printers, laser cutters, and CNC routers should be the focus of the Sri Lankan ICT industry (Fernando, 2018). Priorities for Sri Lanka's accession to the WTO Information Technology Agreement should be to enhance its ICT and English language skills standards, increase its investment in digital communication through public Wi-Fi and zero-rated services, and develop versatile and consistent regulations based on the functionality of digital products and services. More generally, the main elements of the path forward are political stability and constructive public policy (De Zylva & Wignaraja, 2018). The level of taxation, which is a factor in the legal climate, is seen as an enormous obstacle, especially when a company is operating on a comparatively smaller scale. The environmental effect on entrepreneurs in various industries was examined and it could be found that most entrepreneurs were negatively impacted by the overall atmosphere (Gamakumara, 2008).

The 2019 ICTA Workforce Report shows that in 2018, revenues from exports of telecommunications, computer, and information services (according to Central Bank of Sri Lanka Reports) rose to US\$ 995 million. From US\$ 920 million in 2017, this is a 7.5% increase. US\$ 848 million (85% of total earnings in 2018) was raised jointly by ICT and BPM firms, while telecommunications contributed US\$ 147 million (15%). Over the past five years, the sector has expanded by 120%, becoming the economy's fifth-largest source of foreign earnings (Abeywickrama, Degamboda, & Manchanayake, 2020). In its strategic report in December 2016, the Sri Lanka Association for Software and Services Companies (SLASSCOM) set out the industry's objectives to be achieved by 2022, such as US\$ 5 trillion in export revenue, 200,000 people

employed in the industry, and 1,000 new start-ups in this sector. This was revised in 2020 to reach US\$ 3 billion and 300,000 jobs by 2025, in line with the vision of the new president of Sri Lanka. It is also worth noting that the goal has been lowered from US\$ 5 billion (to be achieved by 2022) to US\$ 3 billion (to be achieved by 2025). The argument itself reflects the difficulties faced by the industry in growing its revenue.

As there are no figures on undertakings that have failed in their attempts, it is understood that the majority of new technology undertakings do not make their first year of operation because of several different reasons (Damodaran, 2009). Knowing what the primary cause of failure was and what steps to take to make it a success would be helpful for potential entrepreneurs in the Sri Lankan tech start-ups' echo system.

Research gap

The main focus of this study is to explore the key factors contributing to the failures of technology start-ups in Sri Lanka. A thorough examination of existing literature has uncovered significant gaps in research related to this topic. While numerous studies have explored the reasons behind tech start-up failures in various countries, limited research has been conducted on a phenomenological exploration based on the lived experiences of technology start-up leaders. The existing literature predominantly focuses on tech start-up failures in other geographical regions, and its applicability to the Sri Lankan context remains uncertain. There has been no significant study done in Sri Lanka about the unique challenges faced by Sri Lankan tech start-ups. This study has been undertaken against these backdrops.

METHODOLOGY

Design approach

The goal of this research is to identify the most significant failure factors that have impacted tech start-up failures. For this analysis, failed start-ups and their founders are considered the target population. The thesis focuses on a series of case studies of several entrepreneurs in Sri Lanka who created their start-ups and eventually failed them. The adopted strategy also incorporated the variables experienced by each and every creator. There are different kinds of methods of study that use various instruments for collecting data. Of these forms, the qualitative analysis method is used primarily for this study in order to present the results in a theoretical way.

The choice of the subject, problem, or area of interest, and the paradigm begins with a good research undertaking (Creswell, 1994). There are five types of qualitative approaches that can be used to perform a study, as this study focuses more on the phenomenon or occurrence (start-up failures) and the purpose of this study is to explain and understand how this event happens and how the phenomenon is evaluated. To perform this qualitative analysis, phenomenological research is used as the most suitable process. Interviews are usually performed with a group of people who have first-hand knowledge of the occurrence, circumstance, or experience. Two major questions are presented in the interviews (Moustakas, 1994): What have you encountered in terms of the phenomenon? What contexts or circumstances have usually affected your phenomenon experience (Creswell, 2013)? Unlike positivists, phenomenologists believe that the researcher cannot be excluded from his/her own premises and that the researcher should not pretend otherwise (Hammersley, 2000).

The researcher himself is a victim of start-up failure, so it is convenient for him to pursue the phenomenological analysis, rather than performing a survey, as he has a better understanding of the context. The aim of the phenomenological approach is to illuminate the particular, to define phenomena by how the actors in a situation interpret them. This usually translates into the collection and representation of deep data and experiences in the human sphere through inductive, observational approaches such as interviews, conversations, and participant observation from the viewpoint of the research participant(s) (Lester, 1999).

Sample selection

The main step for the selection of the participants was their willingness to share their perspectives and freely express their views. A second requirement was the possession of features applicable to the phenomenon being studied (Simmons, 2007). A non-probability sampling technique, purposeful sampling, involved selecting participants based on specific characteristics relevant to the research questions where the goal is to obtain rich and in-depth information about the phenomenon being studied. A sample size of 12 participants is sufficient in a phenomenological qualitative study to collect the data needed to explain the study phenomenon. A large sample size is not usually needed by researchers performing phenomenological research, since an increased number of respondents does not always lead to an improvement in research quality. Creswell (2005) suggested that “superficial perspectives” could result in a large number of cases (p. 207). According to the quality of the results, the final number of participants in a study may vary. Additional respondents

would have been appropriate if no definitive patterns emerged from the interviews conducted with 12 participants. Participant interviews should continue till saturation occurs (Reaves, 2008). There were 12 participants interviewed in the current analysis. The sample was selected from among the failed technology start-ups in Sri Lanka under the following criteria:

- 1) The company must have been founded between the years 2022 and 2010. Since the research looks at tech start-up companies, a ceiling was a prerequisite for the year that it was created. The specific industry is rapidly evolving, as stated in the literature review, and some factors affecting earlier start-ups can currently be decreased. Due to the lack of the minimum required numbers for a statistically reliable sample, the cap was considered up to the year 2010.
- 2) By completing at least one good project, the organization has to represent the local software market or the foreign software market. Companies catering to the local market and having a mixed portfolio of markets (local and overseas) were considered for the study. The company could have launched a product that is already in the MVP stage of the product life cycle if the company is a product-based company.

Confidentiality and informed consent

The participants were asked to sign an informed consent form before beginning the interview, indicating that they understood the intent of the study and the possible risks of participating in the study. Unforeseen findings, pressures, and discomfort are included in the risks. Even if the research poses minimal risk to the participants, researchers should obtain informed consent from respondents (Creswell, 2005). The signatures of the participants indicated they were willingly involved in the study. The signatures also suggested that for the purpose of the analysis, the participants allowed the researcher to use the information they provided. Each participant received an oral explanation of the intent of the study and the reason for choosing the participant for the study at the beginning of the interview.

The identity of and the data obtained from the participants remained confidential. Participants received code numbers such as P1, P2, and P3, and the information they provided was coded to ensure that the content of the data collected remained confidential and could not be traced back to the interviewee or to a particular start-up (Walker, 2007). Participants were informed that, even in the written findings and recommendations, their involvement would remain anonymous throughout the study. The information and documentation obtained from interviewees remain in a safe and locked box, as Walker (2007) noted.

Data collection methods

Descriptive research should be carried out in order to recognize critical factors that influence the failures of Sri Lankan technology start-ups since the study focuses on qualitative research. In Gorden (1969), Measor (1985), Oakley (1981), Plummer (1983), and Spradley (1979), among others, interview approaches and problems are discussed.

Interviews are used as the primary source of data, and related researches conducted in various regions are known as the secondary source of data. These secondary data sources are used to explain, through the interviews performed, the data obtained. In our sampling, interviews are conducted with founders and CEOs of struggling tech companies. In order to understand what the most critical failing factors and the least critical failing factors are, the questionnaires were prepared to classify critical failure factors and the weight placed on each factor. The questionnaire consisted of three main sections, as described below.

Section 1: Information on companies

The objective of this section was to obtain qualitative data on the basis of the year of establishment, year of decline, local/overseas market portfolio, product portfolio, financial position, and business model. In terms of freedom of speech, the name of the organization or any other confidential information was not included in the questionnaire.

Section 2: Info on the founder/s

The real goal of this segment is to understand the founder's history, as the founder is the key individual influencing the growth of the start-up, and to consider what the lack of knowledge or comprehension of the viewpoint of the creator is. Here the academic credentials of the founder, experience in the relevant business market, leadership skills, personality, and motivation for business success were addressed.

Section 3: Factors that have an effect on failures

This section focuses on obtaining the knowledge required to identify the most significant factors of failure that affect tech start-ups. Any variables found by the secondary sources of data are also included and given the opportunity to explain their own experience before that. A small Likert scale was presented with them based on the responses to determine the effect of each element.

In addition, due to the importance of evaluating the most significant factors, they were asked to order the factors.

The questionnaire targeted the owners, founders, and CEOs of the sample firms. Via personal contacts, cold phone calls, and sending emails, connections to these people were acquired. To improve the quality of the reviews, a number of interviews were performed in person.

Data collection procedure

The basis for gathering data for the analysis was online meetings. The data collected from the participants revealed their experiences related to variables that affect the failure of start-ups in technology. Data were divided into three categories: demographics of interviewees, lived experience of technology start-up failure, and start-up survival recommendations.

To maintain confidentiality and to analyze the data, the information obtained from the interviews was coded. A thorough analysis of the data offered insights into the data obtained and a sense of it. Statements that were not important to the research question were excluded from the database. Key statements on the perspectives of participants were coded. The aim of coding was to make sense of the information gathered and to divide the data into logical segments. Then the segments were assessed for redundancy. It removed overlapping and redundant data. The data was added to the database at the end of each interview, and new themes were created. 12 participants were included in the interviewing process. While a saturation point was reached after 10 interviews, data obtained from all participants in the study included the interview process as well as the data collection and analysis. From the data review, 12 key themes emerged. Prior to the start of the actual data collection process, a pilot study consisting of two interviews was performed. Feedback on the relevance and consistency of the interview process and the responses are given by the two interviewers evaluating the interview questions. A couple of questions were merged and some were introduced to the list based on the input obtained from participants in the pilot study. The pilot study participants and the data obtained from them were not included in the actual results of the study. The twelve revised interview questions (IQ) are as follows:

IQ1: As a technology start-up leader in Sri Lanka, how would you characterize your knowledge of the crucial factors affecting success in the company's early-stage life cycle?

IQ2: What factors in the first 2 years led to the failure of technology start-ups?

- IQ3: According to your experience, why do most of the tech start-ups fail more often?
- IQ4: What characteristics of leadership have you considered to be crucial to start-up success?
- IQ5: What factors have you found to influence your ability to prevent start up failure, other than leadership? As examples, please refer to variables such as structure, culture, location, legal, marketing, networking, and firm size.
- IQ6: What were the critical characteristics of the market you approached and how did the competition in the industry impact your failure?
- IQ7: What was your understanding of pivot?
- IQ8: What was the impact of investors and related activities on your start-up?
- IQ9: How did the capital structure impact the start-up's failure?
- IQ10: What cultural factors have you found that impact the failure of technology start-ups?
- IQ11: What are the most important elements of a successful technology start-up based on your experience?
- IQ12: Are there any decisions you wish you had made differently when you were running your start-up?

Most of the interviews were conducted online at a convenient time for both parties. Every interview conducted either online or physically was audio recorded in order to validate key points, and manual notes were also taken. Within 24 hours of their completion, the notes and recorded interviews were transcribed into a word document and checked for completeness and meaning. In the first interview, transcript coding allowed the identification of themes and made it easier during subsequent interviews to recognize emerging themes. Interviews persisted until no new themes appeared, with sample saturation being reached. Data analysis was completed using a modified van Kaam approach.

Data analysis method

In this analysis, the researcher chose to use a phenomenological approach to analyze the research issue. The main aim of using the phenomenological approach is to understand the common or mutual experiences of many people about a phenomenon in this specific case, it interviewed founders of tech start-ups who have failed in their start-up journey. It would be useful to understand these common experiences in order to improve practices or policies or develop a deeper understanding of the features of the phenomenon. Researchers

must bracket their own experiences as much as possible to correctly describe how the phenomenon is viewed by the participants.

The process of data analysis uses the data obtained from interviews to identify important statements, expressions, or horizons and give them equal value as it pertains to the research questions. This process is called “horizontalization” according to Moustakas (1994). The researcher will then have to create clusters of meaning into themes from these essential statements. These similar statements and patterns are then used to explain what the participants have experienced (textural interpretation). They are also used to write a description of the background or environment that has influenced how the participants viewed the incident, called creative variation or structural description. From the structural and textural data, the investigator then writes a composite description that offers the “essence of the phenomenon.”

Reliability and validity

There is the potential for a person to incorporate prejudice into the examination in a qualitative sample. There is a need to use multiple data sources, given the negative effect that bias may have on the validity and reliability of the analysis. The use of multiple data sources is known as triangulation for qualitative analysis. The data was obtained in the current qualitative research through a literature review, interviews with study participants, and publicly accessible databases. The reliability of the collected data was improved by triangulation. The validity and reliability of the data were improved by comparing and combining the data obtained from the sources. To have a better understanding of the problem, the analysis included triangulation. Participants were requested to review the accuracy of their statements and corrections to reflect their comments in order to further ensure authenticity and reliability.

RESULTS

The aim of this qualitative phenomenological analysis is to examine the failures of technology start-ups in Sri Lanka and to recognize themes that could show the factors that are impacting start-up failures. Using a qualitative phenomenological study helps people to have a wider understanding of the subject that is being discussed under the given study (Moustakas, 1994). Creswell (2005) argued that when exploring issues that involve a deep understanding of the problem, a qualitative study is suitable. The data was

gathered by conducting an in-depth interview with each participant using the van Kaam modified method (Moustakas, 1994). Interviews were conducted with 12 participants who identified their knowledge of the factors that are impacting the failures of tech start-ups in Sri Lanka.

The population for the study consisted of technology start-up founders/C-level executives in Sri Lanka who have experience in start-up failures. The key criterion for the selection of the participants was the possession of features related to the phenomenon under research, such as education and previous leadership roles in a Sri Lankan technology start-up. The second criterion was their ability to share their perspectives and freely express their views.

Data demographics

Out of 12 interviewees, 10 were male and 2 were female founders. The ages of participants ranged from 22 to 55. Figure 1 highlights the distribution of the ages between participated candidates.

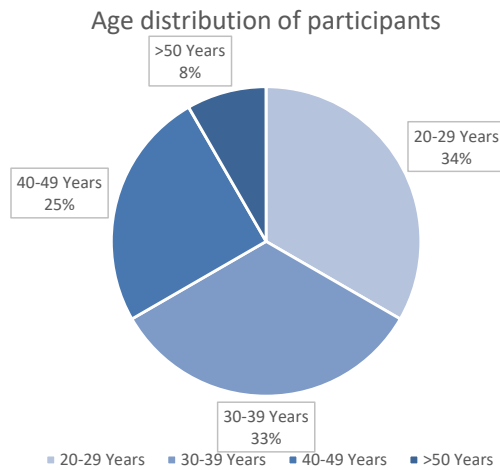


Figure 1. Age distribution of participants

Most of the interviewees are holding a bachelor’s degree from a reputable university. The educational qualification of the participants is distributed from a diploma to a doctorate degree. Figure 2 shows the highest educational qualification achieved by the interviewees.

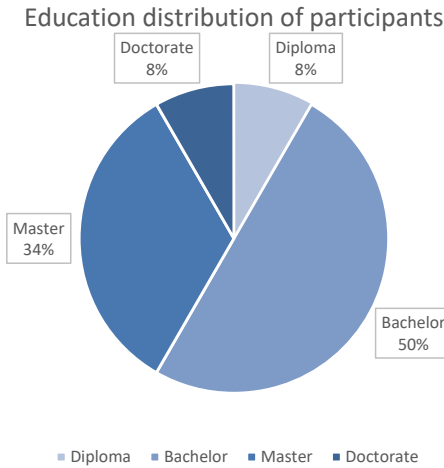


Figure 2. Education distribution of participants

The sample was selected only from start-up founders, co-founders, or C-level executives. If the interviewee is not from the founding team that individual should engage in the business process from day one. The experience in the particular industry of the participants is distributed between 2 years to 15 years. Figure 3 indicates of professional experience gained by participants.

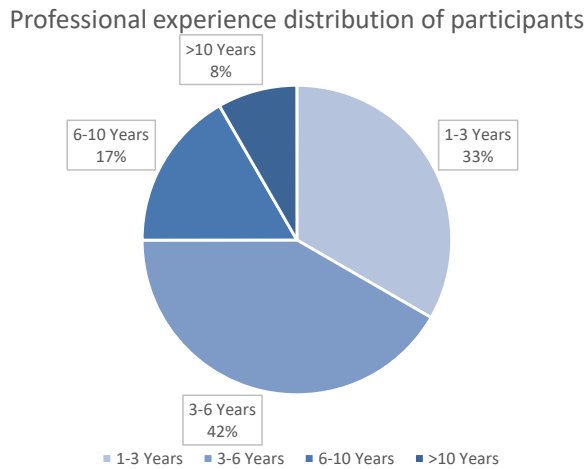


Figure 3. Professional experience distribution of participants.

The length of the interviews ranged from 31 minutes to 67 minutes. One meeting with P9 had to be conducted twice in order to get validation of some

points which he presented in the first interview. The location of each start-up was varied, in order to cover all parts of Sri Lanka, so the participants were selected not only from Colombo but also from other districts of Sri Lanka.

Figure 4 indicates the years of business survival, which varies between 2 years to 10 years. 50% of the 12 start-ups were unable to continue their process for more than 5 years.

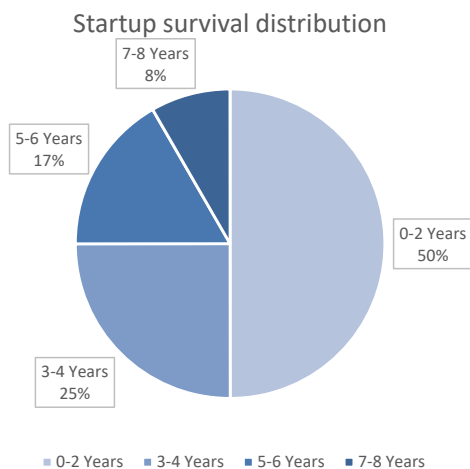


Figure 4. Start-up survival distribution

Study findings

The study consisted of interviews with 12 participants who had held senior roles in a technology start-up in Sri Lanka. The interviews included 12 questions based on the interviewees' lived experience of the phenomenon of technology start-up failure in Sri Lanka. The answers to questions from the interview were formed into patterns. Those patterns were reduced and clustered into 12 core themes using the modified van Kaam process (Moustakas, 1994).

Question 1 asked the following: As a technology start-up leader in Sri Lanka, how would you characterize your knowledge of the crucial factors affecting success in the company's early-stage life cycle? **Theme 1 was financial uncertainty**, which had two sub-themes: running out of money and raising funds when necessary, not when feasible. **Theme 2 was no market research** and the sub-theme was reluctant to gather required market statistics. Question 1 focused on understanding the general perspective of start-up technology leaders on the factors that led in the first years of service to the failure of start-ups in Sri Lanka. Before moving through the more formal

questions that follow in the interview, participants were asked to provide a broad perspective and to express their overall perceived experience. Without restricting themselves to particular aspects of start-up operations, the interviewees could apply to any factor they considered suitable.

Two main themes emerged from the answers obtained (see Table 1). First, financial uncertainty was a concern that 75% of participants posed. The lack of adequate funds slowed down the activities of R&D and marketing, creating a snowball effect. Potential investors have been hesitant to invest in a start-up that has not reached predefined targets. Forty-two percent of respondents indicated that start-up leaders should raise money whenever possible, instead of waiting until additional funding is required. Funds should be collected “whenever possible rather than when necessary,” according to P9. Seven participants indicated that it is the leader’s duty to ensure a positive cash flow. P5 argued that more funds should be raised by start-up managers than they believe are required in case of an emergency.

Second, 58% of interviewees said that being unfamiliar with market needs and demands could impede the success of start-ups. It is important to carefully analyze the needs and desires of the marketplace before releasing a new product. P5 said that revolutionary technologies or products need to meet specific consumer needs rather than the personal opinion of an inventor. P1 claimed that ever-changing industry conditions could lead to the production of products that have no market demand.

Table 1. New patterns emerging from Question 1

Pattern	Participants	No. of responses	% of participants
Financial uncertainty	1,2,3,4,5,6,7,9,10,12	9	75
No market research	1,2,3,5,6,7,9	7	58
Reluctant to gather required market statistics	1,2,5,6,9	5	42
Raising funds when possible, not when needed	2,5,6,7,9	5	42
Running out of cash	5,6,10,12	4	33

Question 2 was as follows: What factors in the first 2 years led to the failure of technology start-ups? **Theme 3 was no product–market fit** (see Table 2). The aim of Question 2 was to understand the variables that affect the failure of technology start-ups in the midlife stage. Newstrom and Davis (2002) and Jones (2007) posited that the factors that influence success or failure change as the start-up moves from one stage to the next. Centralized

power and decision-making characterize organizations during the early stage (Newstrom & Davis, 2002), whereas the midlife stage is characterized by leaders developing “value creation skills and competencies that allow them to acquire additional resources” (Jones, 2007, p. 312).

Ten participants (83%) indicated that not having a product–market fit is the earliest factor of failure. They mentioned that whenever the product is rejected by the market there is only a slight possibility that the start-up will survive. P12 stated that when they realized there was no product–market fit, it was too late, there were no resources left to pivot the idea. P6 argued that a creative product precedes a problem in certain situations, resulting in a successful product searching for a problem it might fix when the problem does not already exist, and in some scenarios, founders follow their gut instincts instead of statistics. P1 said that he had many ideas, but that his main concern was the feasibility to implement those ideas rather than the market requirements and which led him to failure.

Table 2. New patterns emerging from Question 2

Pattern	Participants	No. of responses	% of participants
No product–market fit	1,3,4,5,6,7,9,10,11,12	10	83

Question 3 asked the following: According to your experience, why do most of the tech start-ups fail more often? Three themes emerged from the problem (see Table 3). **Theme 4 was inventors**, which had two subthemes: paranoid conduct and inability to share experience and knowledge. **Theme 5 was a lack of timely response to environmental conditions**, both internal and external. **Geographic location was the 6th theme.**

The purpose of Question 3 was to understand participants’ lived experience of the variables affecting start-up failure regardless of the stage of start-up life cycle level. Seventy-five percent of interviewees said inventors were a major factor that led to the failure of start-ups. Inventors were suspected by participants P2, P5, P6, P7, and P9 of being paranoid about the loss of their conventional organizational control. P6 and P10 noted that inventors are often unwilling to share with other members of the company information and knowledge and experience. Such a lack of collaboration hinders the progress of start-ups. P12 noted that inventors “are in love with their invention and that the pros and cons of their invention cannot be objective.”

Seven interviewees (58%) suggested that hesitation and slow reaction are major obstacles to the success of start-ups. Fast reaction to changing conditions is critical to start-up performance, according to P2, P3, P7, and

P9. The skills and experience required in the early stage of life can vary from those required in the midlife period. As technologies are changing rapidly, technology start-ups are facing uncertainty and they must be up to date with the latest tech stacks, otherwise they get outcompeted, according to P5.

Six participants (50%) suggested that the position of the company was important for a start-up in technology. P2, P5, and P6 claimed that since Sri Lanka is a small island, most of the tech start-ups are highly dependent on global markets. There were barriers to start-up success due to the geographical gap between a start-up based in Sri Lanka and its overseas target markets. Start-ups located closer to the target market are more effective, according to P9.

Table 3. New patterns emerging from Question 3

Pattern	Participants	No. of responses	% of participants
Inventors	2,3,4,5,6,7,8,9,10,12	9	75
Lack of timely response to changing conditions	1,2,3,5,6,7,9	7	58
Location of venture	1,2,5,6,9,10	6	50
Paranoid behavior of inventors	2,5,6,7,9	5	42
Reluctance to sharing knowledge and experience	5,6,10,12	4	33

Question 4 was as follows: What characteristics of leadership have you considered to be crucial to start-up success? **Theme 7 emerged as a lack of diverse skills and experience**, which are important for start-up success. Leadership skills, technical and business experience, and past failures were related sub-themes (see Table 4).

Participants classified the leadership features associated with the success of technology start-ups while addressing Question 4. Nine participants (75%) suggested that diverse business expertise and experience in management or leadership were critical to the success of start-ups. P10 argued that start-ups in technology are difficult organizations. Multidisciplinary expertise and experience in the areas of technology, marketing, finance, and operations should be accessible to the leader of such an organization.

Fifty-eight percent of the participants expressed that leadership skills are mandatory as a start-up leader, most of the time they are self-motivated,

self-disciplinary, and they possess the power to motivate others and get the required contribution from them. Successful start-up leaders need the skills to inspire and motivate workers to initiate and listen to new ideas.

Six participants (50%) posited that start-up leaders in technology need to consider both the technical aspect of an invention and the aspect of business management. Only one of the two factors of gaining experience hinders the progress of start-ups. Many start-up leaders are experienced in business management, according to P6, but have little or no knowledge of technical aspects. This lack of balance between knowledge of technology and industry hinders the success of technology start-ups.

Five participants (42%) suggested that learning from the previous failure is an attribute to the capacity of a leader and helps leaders solve obstacles that are typical of start-up technology. P2 and P5 noted that a leader with experience and wisdom of past failures is well prepared to deal with the difficulties involved in running a complex operation such as a start-up of technology. P6, P7, and P9 suggested that leaders who have never struggled could develop an arrogant attitude and extreme self-confidence that could inevitably lead to start-up failure.

Table 4. New patterns emerging from Question 4

Pattern	Participants	No. of responses	% of participants
Diverse skills and experience	2,3,4,5,6,7,8,9,10,12	9	75
Leadership skills	2,3,5,6,7,9,10	7	58
Technical and business experience	2,5,6,9,10,12	6	50
Past failures	2,5,6,7,9	5	42

Question 5 asked the following: What factors have you found to influence your ability to prevent start-up failure, other than leadership? As examples, please refer to variables such as structure, culture, location, legal, marketing, networking, and firm size. Two themes emerged from the answers to Question 5 (see Table 5). **Theme 8 is lack of innovation and technological competitive advantage. Theme 9 was poor marketing.**

The aim of Question 5 was to differentiate between factors related to leadership and factors other than leadership that affect technology start-ups' failure. Eight interviewees (67%) said products produced by a start-up in technology must have a technological competitive advantage. P7, P8, P9, and P12 argued that if the company could not compete with existing products in the market, products without a technological competitive

advantage would be doomed to fail. Six participants (50%) replied that the products of the company must be innovative. P3, P5, P6, and P7 argued that the products of a start-up must be innovative as well as have a technological competitive advantage.

Sixty-seven of participants stated that poor marketing can lead a start-up to failure. P12 mentioned that most of the start-ups are failed to find the right marketing team and they are not market their products at the right time which results in running out of cash and a lower conversion rate.

Table 5. New patterns emerging from Question 5

Pattern	Participants	No. of responses	% of participants
Technological competitive advantage	1,3,4,5,6,7,8,9,12	8	67
Product innovation	3,5,6,7,9,12	6	50
Poor marketing	3,5,6,7,9,10,12	7	58

Question 6 was as follows: What were the critical characteristics of the market you approached and how did the competition in the industry impact your failure? In order to answer this question, participants reflected on their ideas about the market and the competition, and **theme 10 was initiated as get outcompeted**. Forty-two percent of participants stated that competition heavily impacted their failure. Initially, they hadn't realized that there would be such competition, which was because of their poor market research. P6 said that it's mandatory to understand your competitors and their business models and make sure you have enough resources to sacrifice because of the competition (Table 6).

Table 6. New Patterns Emerging From Question 6

Pattern	Participants	No. of responses	% of participants
Get outcompeted	1,3,4,5,6	5	42

Question 7 was as follows: What was your understanding about pivot? The intention of this question was to understand how they apply pivot as a survival strategy and what their expression about pivoting is. Seven participants (58%) expressed their idea about pivoting. Out of these lived experiences, **theme 11 has emerged as pivot**. Failure to pivot and pivoting went bad emerged as sub-themes (see Table 7).

Four participants mentioned that failure to pivot when needed led start-ups to an early failure. P4 expressed that if they found out their ideas are not working prior to running out of cash, they will survive. P10 also expressed a similar experience by saying that there was an opportunity if we pivot.

Twenty-five percent of participants indicated that their pivot went bad while expressing that a pivot can make both positive and negative impacts on the company. P3 said that they lose the focus of their niche market and wanted to expand to a larger market (the company wasn't ready), which lead to their failure at the first point.

Table 7. New patterns emerging from Question 7

Pattern	Participants	No. of responses	% of participants
Pivot	3,4,5,8,9,10,12	7	58
Pivot went bad	3,5,12	3	25
Failure to pivot	4,8,9,10	4	33

Question 8 was as follows: What was the impact of investors and related activities on your start-up? This question was intended to understand the correlation between investors (angel investors, venture capitalists, and stakeholders) and business-related activities. **Theme 12 has emerged as venture capital financing.** Nine participants (75%) suggested that start-up failures were due to venture capitalists (VCs). The primary emphasis of VCs was on short-term targets, according to P9, and they planned to rapidly accumulate high profits (see Table 8). In order to speed up processes such as time-to-market, even though speed hindered efficiency, the VCs forced start-up managers into shortcuts. P7 claimed that the decision-making phase of VCs was long, often resulting in a lack of time for strategic decisions to be implemented. P17 noted that start-ups in technology need to be agile so they can adapt quickly to changes in the market. Finally, VCs enforced strict policies and procedures that had a detrimental effect on technology start-ups' much-needed nimbleness.

Table 8. New patterns emerging from Question 8

Pattern	Participants	No. of responses	% of participants
Venture capital financing	1,3,4,5,6,7,9,10,11	9	75

Question 9 was as follows: How did the capital structure impact the start-up's failure? Participants defined the capital structure they posed in

order to address Question 9 in terms of timing, size of the investment, type of investor, equity requirements, and loans, among others. The negative effect VCs had on the success of technology start-ups was emphasized by eight participants (67%). P3, P4, P8, P10, and P11 suggested that the start-up's capital structures hindered the organization from operating effectively and posed challenges to its progress. Since VCs owned significant proportions of start-up equity, they enforced strict processes for decision-making. In prior interview questions, participants repeated similar comments. Because of that, from question 9, no new patterns emerged.

Question 10 asked the following: What cultural factors have you found that impact the failure of technology start-ups? Eight participants (67%) suggested that cultural factors did not impact the failure of start-ups in technology (see Table 9). Participants P2, P4, and P5 replied that in their initial process, there was no need for a structured culture in a technology start-up. All start-up employees were multifunctional and self-motivated, performing any task necessary according to P2. Such workers did not need a formal system of organization, policies, structured meetings, or a code of conduct. Participants P5 and P12 concluded that, since they limited the versatility and creativity of start-up employees, these cultural factors could also impede start-up success. P5, P6, and P8 thought that one of self-initiative, quality, pace, can-do attitude, and the belief that no job is too small was the culture in most of the tech start-ups. Participants did not connect culture to the start-ups or their failures. From Question 9, no new themes were developed.

Table 9. New patterns emerging from Question 10

Pattern	Participants	No. of responses	% of participants
No influence	2,3,4,5,6,7,8,12	8	67

Question 11 asked the following: What are the most important elements of a successful technology start-up based on your experience? The aim of Question 11 was to understand how participants describe a successful start-up of technology and what they consider as important features needed for a successful start-up. The inventors and founders of a technology start-up are the most important factor in the company's success or failure, six participants (50%) said so. As an integral aspect of a successful technology start-up, five participants (42%) suggested technological competitive advantage. In the dynamic world in which technology start-ups compete, P6, P9, and P11 concluded that start-ups that have products but no technological competitive advantage would not succeed. Three participants (25%) suggested that demand and the product–market fit were crucial to the start-up's success,

whereas four participants (33%) emphasized that innovation is critical to start-ups' success. From Question 11, no new trends arose.

Question 12 asked the following: Are there any decisions you wish you had made differently when you were running your start-up? The aim of Question 12 was to decide if, during the initial or maintenance process of the start-up, participants would have made various decisions. The majority of participants (67%) suggested that they would have collected more funds to alleviate cash flow requirements and finance research and development projects (see Table 10). Six participants (50%) suggested that inventors were responsible for the failure of start-ups, and 42% of participants wished decisions to be taken on a timely basis. From Question 12, no new theme emerged.

Table 10. New patterns emerging from Question 12

Pattern	Participants	No. of responses	% of participants
Raise more funds	1,3,4,5,6,7,8,9,12	8	67
Inventors	3,5,6,7,9,12	6	50
Timely response to changing conditions	3,5,6,7,9	5	42

DISCUSSION

Discussion of emerged core themes

The paper presented 12 core themes under the study findings. The core themes that emerged from the qualitative phenomenological study addressed the key research question: What are the critical factors that are impacting on failures of tech start-ups in Sri Lanka? The comparison of the study themes with the outcomes of related research was challenging because there was minimal publication of literature on technology start-up failures in other countries and in Sri Lanka. Some of the themes coincide with the results of studies performed in other countries, although those previous studies have not identified the rest of the themes.

- 1) **Financial uncertainty.** Both respondents described financial uncertainty as an obstacle to the success of start-ups (Questions 1, 2, 3, 5, and 9). Several causes of financial instability were identified by the participants. Nine participants noted that they lacked money, and they expected more funds to be collected than they actually did. P4 said start-up leaders should collect more funds than needed: "Don't run out of cash." P13

noted that funds should be collected “whenever possible, rather than when necessary.”

These results are compatible with previous research (Cressy, 2006; Simmons, 2007; Song et al., 2008). The challenge of accessing financial capital hinders a small firm’s progress, according to Simmons (2007). Financial resources have been described by Song et al. (2008) as key to the success of technology ventures.

Eight participants (67%) listed the capital structure as a source of start-up failure (Question 9). Instead of accepting the investment as a loan, P9, P10, and P11 argued that start-up management should issue equity to investors. Based on the experience of those participants, equity holders were more committed relative to financial investors to the strategic objectives of the company. P3 and P9 suggested that all shares should be distributed as common shares. Unrest and antagonism among shareholders were generated by the allocation of various class shares, such as common versus preferred.

- 2) **No market research.** Most of the respondents said that market research and marketing were key factors in the success of start-ups (Questions 1, 2, 3, 11). The results coincided with previous research. Nine aspects of marketing have been defined by Song et al. (2008), such as competitive strength, environmental dynamism, breadth of market development, and product innovation. Six participants (50%) in the current study described unfamiliarity with consumer demands as an obstacle to start-up success (P1, P2, P5, P7, P10, and P12).

P1 claimed that changing industry conditions could lead to products that have no market demand. The need for the product could diminish or become non-existent by the time the product is ready to launch. P5 indicated that innovative products should solve real consumer needs rather than “the wishful thinking of an inventor”. P10 argued that an innovative product precedes a problem in certain situations, resulting in a successful product for a non-existent problem/market.

- 3) **No product–market fit.** All participants except P2 and P8 (ten participants, 83%) agreed that no product–market fit is the most crucial fact that threatens start-up success. P10 stated that most of the start-up founders, often called visionaries, have their own imagination that is contributing to the innovation of products, but that same imagination can lead to failure because of less concern about the market fit. During the first 2 years of operations, the chances of failure for small companies are highest (Cressy, 2006), because whether they have an innovative product they don’t have a market to reach, there is no real customer need. According to Cantamessa et al. (2018), if the product or service can theoretically meet needs or fix problems, but these are actually not experienced by consumers, this is a more serious case of wrong product–market fit.

- 4) **Paranoid behavior of inventors.** Nine respondents (75%) indicated that inventors were solely responsible for the failure of the start-up (Question 1). P3, P9, and P12 noted that inventors were suspicious and hesitant to share the information and expertise they possessed with other members of the company. Start-up success was hampered by this lack of collaboration. P10 argued that inventors “are in love with their invention” and that their invention’s shortcomings or lack of competitive advantages may not be objective. Inventors also fear losing their conventional power roles in the company by sharing their expertise with their teammates (Weidenbaum, 2004), and such behavior impedes the start-up’s effective future.
 - 5) **Lack of timely response to changing conditions.** Seven respondents (58%) argued that failure to respond promptly to changing environmental conditions, both internal and external, could lead to start-up failure (Questions 2 and 3). Participants P3, P5, and P9 argued that rapid response to changing conditions is crucial for tech start-up success. Each stage in the life cycle of a start-up could require different skills in leadership. As such, management should make timely decisions to replace members whose strengths and characteristics are not compatible with the needs of start-ups. The participants thought that procrastination was, at times, a significant obstacle to effectively carrying out strategic initiatives. Those findings are comparable to previous research. Previous research has shown that during the early stage, technical expertise and management skills are important and may vary from those needed in the midlife stage (Jones, 2007; Newstrom & Davis, 2002; Rutherford et al., 2004). Organizations move through stages known as life cycles, and each stage can require different skills and styles of leadership (Swiercz & Lydon, 2002). To minimize failure rates, leaders who lack suitable skills should be replaced in a timely manner.
 - 6) **Location of the venture.** Six participants (50%) suggested that the start-up location greatly impacted the company’s success or failure (Question 5). The study’s results were consistent with previous studies. Location becomes crucial as it defines customer usability, according to Simmons (2007). The Internet started to alter the position of the organization and its effect on small business failures. As shown by the participants, the Internet has become an important part of their businesses, supporting Wyse’s findings (2004). Gupta and Govindarajan (2004) recognized that there was an effect on physical location, but argued that attention should also be given to how the Internet and e-commerce reshaped the way business was completed. In agreement with Gupta and Govindarajan, many small business owners can eliminate the characteristics of physical boundaries through their use of the Internet.
 - 7) **Lack of diverse skills and experience.** Nine respondents (75%) suggested that technical and business expertise is crucial to the success of a start-up
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in technology. The diverse and often competing interests of the company's numerous stakeholders, including entrepreneurs, shareholders, boards of directors, and staff, need to be navigated by leaders.

Such findings are equivalent to previous research. Simmons (2007) observed that the expertise of business leaders is crucial to the success of start-ups. Firm success is attributed to good leadership according to Zornada (as cited in Calloway & Awadzi, 2008), while "failure or underperformance is also readily attributed to poor leadership" (p. 1). Huyghebaert et al. (2007) observed that in the first four years of service, leadership is one of the key factors affecting small businesses. It is important for potential entrepreneurs to evaluate new venture attempts in order to identify the leadership characteristics that impact the success or failure of new ventures (Fried, 2006).

Five participants (42%) proposed past failure is an advantage because failure equips a leader with the experience and wisdom to deal with the difficulties involved in running a complex operation such as a technology start-up. Such results are fresh and unexpected. The results of this study that prior failures are beneficial for a technology start-up leader were not confirmed by an analysis of previous literature. Song et al. (2008) described "the experience of the firm's management team in previous start-up situations" as influencing start-up performance, but the researchers did not indicate whether the experience was of a successful start-up or an unsuccessful start-up.

- 8) **Lack of innovation and competitive technological advantage.** Eight participants (67%) defined product innovation and technological competitive advantage as key components of a successful start-up (Questions 1 and 11). Failure to combine innovation and technical advantage may lead to start-up failure. P6, P9, and P12 argued that they will not succeed in the dynamic world in which technology start-ups compete unless start-ups had products with a technological competitive advantage. The study results are compatible with the meta-analysis performed by Song et al. (2008). The researchers described product innovation as the "degree to which new ventures develop and introduce new products or services." Product innovation is one of the 24 factors needed for new venture success, according to Song et al. (2008).
- 9) **Poor marketing.** Seven participants (58%) concluded that poor marketing results in a start-up failure. Poor marketing has been identified as not having a proper marketing plan, not having resourceful people to conduct a good promotional campaign, and not having enough money to run a prompt campaign. Tech start-ups are constrained in their capacity to promote the brand. The Internet offers a greater stage for the promotion of small businesses, but owners are still constrained because their ability to do mass advertising is impeded by a lack of capital. A negative image or stereotype follows the mark of small businesses beyond resource and

- advertisement constraints. Potential consumers view small companies as less capable of performing tasks than larger ones.
- 10) **Get outcompeted.** Five participants (42%) mentioned getting outcompeted as a reason for tech start-up failure. According to P3, most of the tech start-ups are doing business in very competitive markets, where competitors sometimes create threats to other existing businesses ambitiously and he had to undergo such a situation many times while running the company. Most of the time start-ups get outcompeted at their early stage of the life cycle, as Thornhill and Amit (2003) endorsed by research, failures were more frequent during the early stages of the growth of a company when its leaders were less experienced and the business was small.
 - 11) **Pivot.** Seven participants (58%) stated that a pivot is a critical approach when it comes to start-up success or failure, as a pivot can impact a business in both negative and positive forms. As P3 explained, when start-up leaders are reluctant to take the decision of pivot this can lead to failure and, on the other hand, a pivot can go bad. Three participants (25%) expressed there are scenarios that they faced where a pivot went bad. And another four respondents (33%) responded that failing to take the right decision at the right time to pivot can lead to failures. Hampel et al. (2020) mentioned that, since their original strategy had failed, many new businesses had to pivot and fundamentally transform what they were about. For software entrepreneurial teams to make better decisions in volatile and unpredictable environments, a better understanding of the different types of pivots and the various factors that lead to failures and cause pivots are required, according to Bajwa et al. (2017). Prior study results are aligned with current findings.
 - 12) **Venture capital financing.** Nine respondents (75%) described venture capitalists (VCs) as an obstacle to the success of technology start-ups (Questions 1, 2, 3, and 9). VCs were focused on short-term targets, according to P8. VC managers expect that they would obtain high profits quickly. Even when speed was adverse to efficiency, they also placed pressure on start-up managers to take shortcuts to speed up processes. P8 also reported that it took too long for VCs to make decisions, contributing to the loss of precious time. By the time they make decisions, the start-up ran out of cash, key individuals left the company, and other investors were hesitant to commit additional funds. Then it is too late to stop the failure. P7 said technology start-ups should be agile and adapt quickly to changing environmental circumstances. Instead, VCs implemented strict procedures that had a detrimental effect on technology start-ups' much-needed versatility. Davila et al. (2003) in their research, compared venture capital financing with start-up success with a positive impact but 75% of the current study did not agree with that.
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CONCLUSION

The study of the experiences of 12 technology start-up leaders in Sri Lanka may lead to a better understanding of the factors causing Sri Lanka's tech start-up failures. The 12 key themes that emerged from the study influenced the recommendations that could contribute to mitigating technology start-ups' potential failure and resulting in lower failure rates. The researcher has summarized the recommendations into four distinct sections for better comprehension: financing, market research, leadership, and inventors.

- 1) **Financing.** In the early phase of the start-up, VCs impede start-up progress based on the results of the report. Until a later point in the life cycle of the company, start-up management should avoid collecting funds from VCs. Initial funds should be collected from angel investors, strategic partners, government funds, and technical institutions. Company management should collect funds from VCs only after reaching a point that enables the company to negotiate with VCs on equal terms and attain mutually beneficial terms and conditions of investment. Although this recommendation is in contrast to previous research, it is centered on the lived experiences of nine (75%) participants in the study. VCs were identified by the participants as a significant cause of start-up failure. VCs are short-term focused, as noted earlier, and their priorities often do not fit with the objectives of the start-up. These varying objectives often lead to collusion. Negotiating on an equal basis with VCs would help to resolve historical impediments and contribute to greater start-up success rates.
- 2) **Market research.** For start-ups, market research is a vital success factor. It is important to find a market niche for a new innovative product and be able to fill this niche. Seven participants (58%) reported performing market research to evaluate market requirements, but only after the organization raised funds, recruited workers, and conducted a feasibility study to assess the applicability of scientific and technical concepts. The production of the company's products had little to no gain from doing experiments at a later point since the money had already been raised and workers had already been recruited to produce a particular product. At this point, the pivot was practically and literally impossible, leading to start-up failure. The absence of timely market research was a cause of start-up failure, six participants (50%) suggested. These results are comparable to previous research (Song et al., 2008). As such, conducting timely market research may result in higher technology start-up success rates.
- 3) **Leadership.** A technology start-up is a complex activity, according to P10, as it includes various disciplines such as technology, marketing, finance,

production, and management. Leaders of such dynamic activities have a critical effect on the new venture's success or failure. It is important to pick a leader who possesses the unique needs of the start-up. The results of the study showed that a technology start-up leader must have the following three characteristics: (a) competence and skills in technology and business, (b) political acumen, and (c) experience acquired from previous failures. Six respondents (50%) suggested that the technical and business backgrounds of leaders are essential to the success of start-ups (Question 1 and 4). P2 and P12 indicated that gaining expertise in only one of these two fields hinders the success of start-ups.

- 4) **Inventors.** An inventor also owns the concept and know-how for the innovative products of start-ups, which puts the inventor in an organization's power role. It is important to understand the barriers to technology start-ups that inventors might face. Knowing these barriers could equip leadership with the tools to resolve or at least mitigate some of the barriers. Nine participants (75%) listed inventors as a major cause of start-up failure (Questions 1 and 11). In the literature, the finding had no relation. P3, P4, and P12 believed that the inventors were paranoid. Inventors also refuse to share experiences and information with other members of an organization. P10 argued that inventors "are in love with their invention" and cannot assess objectively the competitive advantages of their invention, if any. P10 concluded, "the first thing I would search for before entering or investing in a start-up in technology are the inventors; they are the most important factor affecting start-up success or failure".

Management and the inventor should mutually agree on terms and conditions of employment, including ownership of patents, trademarks, and ownership of organizational symbols, in order to resolve these barriers. The importance of collaboration and sharing knowledge with other members of the company is important for inventors to understand. Before the investment is made, certain agreements must be executed.

Twelve core themes emerged from the results of the analysis. While the themes explain the causes of start-up failure, the study did not discuss the relationship between start-up leaders' responses and the survival rate of their tech start-ups. Future researchers might wish to explore whether leaders of successful and unsuccessful start-ups differ significantly in their responses about the causes of start-up failure.

The demographic data showed that all of the study participants had at least a diploma. The selection of participants was purposeful but the main focus was years of experience and willingness to share their experiences. Although the study excluded self-taught start-up leaders, potential researchers might wish to include self-taught leaders in technology start-ups in Sri Lanka.

Technology start-ups in Sri Lanka were the focus of the study. Findings of the negative impact that VCs and inventors had on start-up success were new and unexpected. Future researchers may wish to explore the degree to which these results extend to other industries and other geographies.

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Abstrakt

CEL: Głównym celem tego badania jakościowego było zbadanie niepowodzeń start-upów technologicznych na Sri Lance w celu wyłonienia tematów, które wyjaśniają krytyczne czynniki wpływające na niepowodzenia start-upów technologicznych na Sri Lance, a także zidentyfikowanie zaleceń, które mogłyby pomóc uniknąć tych czynników. W artykule przedstawiono również odkrycie, jak wzbogacić przedsiębiorców technologicznych, aby budowali swoje strategie ze zrozumieniem czynników prowadzących do niepowodzenia i podejmowali dobrze przemyślane decyzje. **METODYKA:** Badanie opiera się na jakościowym podejściu badawczym, które pomaga przedstawić

wyniki w sposób teoretyczny. Analiza fenomenologiczna została wykorzystana do zidentyfikowania, zrozumienia i przeanalizowania zjawiska niepowodzeń start-upów technologicznych. W badaniu wzięło udział dwunastu liderów start-upów, którzy podzielili się swoimi doświadczeniami z porażek start-upów technologicznych na Sri Lance. Przeprowadzono z nimi wywiady w oparciu o dwanaście pytań, a dwanaście głównych tematów wyłoniło się na podstawie doświadczeń uczestników. W analizie danych wykorzystano zmodyfikowane podejście Van Kaama, wykorzystujące siedmioetapowy schemat uwzględniający strukturalne i tekstowe aspekty doświadczeń, jak również percepcyjne cechy zjawiska. **WYNIKI:** Tematy odpowiadały na kluczowe pytanie badawcze: *Jakie są krytyczne czynniki, które mają wpływ na niepowodzenia start-upów technologicznych na Sri Lance? Przyczyny niepowodzeń start-upów technologicznych według obecnego badania były różne, w tym niepewność finansowa, brak badań rynku, brak dopasowania produktu do rynku, paranoiczne zachowania innowatorów, brak terminowej reakcji na zmieniające się warunki oraz lokalizacja przedsięwzięcia.* **IMPLIKACJE:** Artykuł zwięźle przedstawia dwanaście krytycznych przyczyn niepowodzeń start-upów technologicznych. Wyniki badań umożliwią start-upom technologicznym ze Sri Lanki zidentyfikowanie kluczowych czynników niepowodzenia dla rozwoju ich strategii przetrwania. Identyfikacja ukrytych przeszkód w branży pomaga przedsiębiorcom przygotować się na pułapki i dostarcza decydującym wskazówek, jak dokonywać świadomych wyborów podczas wdrażania polityk krajowych. Co ważniejsze, odkryto, że głównymi obszarami wymagającymi większej uwagi są przywództwo, finansowanie, marketing i innowacje. Na koniec omówiono cztery grupy zaleceń w zakresie finansowania, badań rynku, przywództwa i wynalazców. **ORYGINALNOŚĆ I WARTOŚĆ:** Porównanie aktualnych tematów badań z wynikami pokrewnych badań jest niejednoznaczne, ponieważ literatura dotycząca niepowodzeń start-upów technologicznych w innych krajach i na Sri Lance jest znikoma. Niektóre tematy pokrywają się z wynikami badań przeprowadzonych w innych krajach, chociaż niektóre tematy zostały zbadane w inny sposób.

Słowa kluczowe: przedsiębiorczość, przedsiębiorca technologiczny, porażka start-upu, krytyczne czynniki sukcesu, start-up oprogramowania, strategie przetrwania, start-up technologiczny

Biographical notes

Kesara Wimal earned his MSc degree in advanced software engineering from the University of Westminster, London. He completed another master's degree in the field of business administration and was awarded a special prize for his research. He acquired his bachelor's degree in the domain of computer science as a first-class honors degree. His areas of research interest include entrepreneurship, cryptocurrency, blockchain, and distributed systems. He has been running his own tech start-up since 2018, catering to millions of users worldwide.

Selvaratnam Ajendra is a lecturer with more than ten years of academic experience, attached to Global Banking School (GBS) in London, and the founding director of Vdemia.com an EdTech start-up in Sri Lanka. He has a bachelor's degree in computation and management from the University of Peradeniya coupled with a master's degree from PIM, the University of Sri Jayewardenepura. He is also an associate member of CIMA, UK and CGMA and a senior member of AAT, Sri Lanka. His research interests are entrepreneurship, sustainable entrepreneurship, and EdTech.

Authorship contribution statement

Kesara Wimal: Conceptualization, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Methodology, Software, Validation, Visualization, Writing – Original Draft, Writing - Review & Editing. **Selvaratnam Ajendra:** Conceptualization, Investigation, Methodology, Project Administration, Resources, Supervision.

Conflicts of interest

The authors declare no conflict of interest.

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Going green to keep talent: Exploring the relationship between sustainable business practices and turnover intention

Anna Florek-Paszowska¹ 
Carlos Arturo Hoyos-Vallejo² 

Abstract

PURPOSE: This study explores the association between sustainable business practices (SBP) and turnover intention (TI) to understand the role of sustainability initiatives in influencing employee retention and organizational commitment. **METHODOLOGY:** The present study conducted a systematic literature review (SLR) following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement. From an initial selection of 326 articles, a rigorous double-blind screening process identified 31 key papers for in-depth analysis. **FINDINGS:** The systematic review provides compelling evidence that SBP have a robust positive association with employee outcomes, especially in reducing TI. This relationship is notably mediated by job satisfaction and organizational commitment and moderated by psychological safety and ethical leadership elements. Further, key gaps were discerned, including the necessity to explore the varied impact of SBP across industries, the enduring effects of SBP on TI, the influence of cultural and contextual facets, and the urgency for methodological advancements in cross-cultural research. In response to these gaps, four hypotheses were conceptualized to provide deeper insights into the complex interplay between SBP, TI, and overarching cultural/contextual variables. **IMPLICATIONS:** Theoretically, this research adds to the existing literature by empirically validating the relationship between SBP and TI, highlighting critical mediators and moderators, and suggesting avenues for future research. Incorporating the identified gaps and proposed hypotheses provides a structured direction for subsequent investigations.

1 Anna Florek-Paszowska, Ph.D., Associate Professor, CENTRUM Católica Graduate Business School, Lima, Perú, Pontificia Universidad Católica del Perú, Lima, Perú, Urb. Los Álamos de Monterrico, Jirón Daniel Alomía Robles 125, Santiago de Surco 15023, Perú, e-mail: aflorekpaszkowska@pucp.edu.pe (ORCID: <https://orcid.org/0000-0002-1249-5069>).

2 Carlos Arturo Hoyos-Vallejo, Ph.D., DBA, Professor, CENTRUM Católica Graduate Business School, Lima, Perú, Pontificia Universidad Católica del Perú, Lima, Perú, Urb. Los Álamos de Monterrico, Jirón Daniel Alomía Robles 125, Santiago de Surco 15023, Perú, e-mail: choyosv@pucp.pe (ORCID: <https://orcid.org/0000-0003-3571-7178>).

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The findings emphasize the importance of integrating SBP into organizational strategies to promote sustainability while enhancing workforce well-being and retention. Organizations can align with sustainability goals and boost employee satisfaction by focusing on organizational commitment, open communication, and leadership grounded in ethical and sustainable principles. ORIGINALITY AND VALUE: This research provides a comprehensive overview of the interplay between SBP and TI, integrating insights from various studies. By emphasizing understudied mediators and moderators, identifying research gaps, and outlining derived hypotheses, the study sets the stage for future inquiries. Its practical recommendations are essential for organizations that balance sustainability goals with workforce stability, benefiting organizational performance and employee satisfaction.

Keywords: sustainable business practices, turnover intention, TI, job satisfaction, employee engagement, organizational commitment, employee involvement, employee empowerment, systematic literature review, PRISMA, future research directions, hypotheses, research gaps, green HRM

INTRODUCTION

Organizations must retain talented employees to achieve long-term success in today's business world. Ensuring employee retention holds greater significance than recruiting and training new employees due to the substantial investment of time and resources required (Emmanuel et al., 2021). The impact of turnover can be felt in many areas, including productivity, the overall quality of products or services, and the bottom-line profitability of an organization. In order to remain competitive, enhance productivity, and foster innovation, organizations must prioritize the retention of motivated and skilled staff. The employees within an organization have the potential to be the main source of sustainable competitive advantage (Mehrez & Bakri, 2019). Employee turnover encapsulates the reasons employees choose to leave organizations. While numerous factors can influence an employee's intention to exit, TI stands out as the strongest predictor of actual employee departure (Griffeth et al., 2000; Juma & Lee, 2012). The causes for this intention are generally bifurcated into 'push' and 'pull' factors. The former arises when organizations either consciously or inadvertently create conditions that encourage departures. The latter, on the other hand, pertains to external opportunities or allurements that draw employees out. To foster a loyal and stable workforce, organizations must discern the myriad factors that culminate in TI. SBP emerge as potent tools in this endeavor, helping organizations mitigate factors that spur turnover (Emmanuel et al., 2021). There are various reasons for high turnover rates in organizations, including poor work conditions and inadequate human resources practices such as

compensation and benefits, employee services, training and development, performance management, and job security. When organizations recruit from an international labor market, maintaining a stable workforce can become even more challenging, as the recruitment process can be time-consuming and expensive (Hoyos & Serna, 2021).

Retaining employees is, therefore, crucial for multinational organizations. However, HR professionals in developing countries and emerging economies may not fully understand the reasons behind high turnover rates and therefore struggle to develop effective strategies to address the issue (Mehrez & Bakri, 2019). Many companies are adopting strategic approaches like SBP to attract and retain top talent to combat this challenge. However, there is a difference between “turnover” and “turnover intention.” In essence, “turnover” refers to the actual act of quitting, where employees leave their current workplace for another organization. On the other hand, “turnover intention” refers to an employee’s intention to quit and the likelihood of leaving their current workplace (Mehrez & Bakri, 2019). By monitoring and addressing TI, organizations can benefit by having an early warning sign of potential turnover. The authors aim to understand the relationship between SBP and TI to help organizations become more proactive in addressing employee engagement, job satisfaction, and overall organizational climate.

After analyzing 326 papers from the Scopus database, it was observed that there was a significant gap in the literature in the business, management, and accounting sectors, particularly with respect to the relationship between SBP and TI over the last decade. This study aims to bridge this gap through a systematic literature review (SLR) guided by PRISMA Statement, covering publications from 2013 to 2023. The SLR began with an initial assessment of 326 papers, eventually narrowing down to 31 crucial studies after a rigorous double-blind review process. The choice of Scopus as the primary database stemmed from its comprehensive coverage in the domains of business and business management. It is noteworthy that a significant portion of studies indexed in the Web of Science database also find a place in Scopus. However, focusing exclusively on this database does present limitations, and the potential inclusion of other databases in future research is recognized.

Given the expansive nature of sustainable business practices, this research adopted a focused lens, emphasizing practices that cater specifically for human talent management and foster an organizational culture conducive to employee retention. This strategic approach was crucial in the systematic sifting of the initial 326 papers, resulting in a select compilation of studies that spotlight SBP from the perspective of responsible human talent management. This study provides a profound insight into the evolution of the field, highlighting trends, patterns, and existing gaps. It also charts

a course for future research directions. The meticulous SLR process ensures a thorough and transparent review, facilitating a holistic grasp of the SBP-TI dynamic. The adopted methodology reflects a dedication to unveiling a nuanced narrative of the SBP-TI relationship, which are further elucidated in the ensuing sections of this paper. The following research questions guide this study:

- RQ1) What are the key findings and topics found based on the SLR regarding the relationship between sustainable business practices and turnover intention?*
- RQ2) How do certain variables mediate or moderate the relationship between sustainable business practices and turnover intention?*
- RQ3) What are the key patterns, trends, and gaps in the relationship between sustainable business practices and turnover intention?*
- RQ4) What are potential future research directions to address the identified gaps and enhance understanding of the factors influencing turnover intention in the context of sustainable business practices?*

The paper is structured as follows: The introduction provides an overview of the significance of talent retention, the role of SBP, and the research questions guiding this study. The theoretical background offers a comprehensive overview of SBP and TI, discussing key concepts, principles, and theories relevant to the research topic. The methodology outlines the systematic literature review process, including the search strategy, inclusion, and exclusion criteria, and using PRISMA Statement and Covidence for a rigorous review. The results and discussion present the findings and in-depth analysis of the results, discussing their implications and significance in the context of existing literature on the SLR, addressing each research question systematically. The conclusion summarizes the key findings and their contributions while also highlighting the importance of studying the relationship between sustainable business practices and TI.

THEORETICAL BACKGROUND

This study focuses on two key areas of research: sustainable business practices (SBP) and turnover intention (TI). SBP are based on sustainability and organizational theories, which explain how businesses can incorporate social and environmental considerations into their operations. Meanwhile, the theoretical perspective on TI explores factors influencing employees' decision to leave their current jobs, including job embeddedness theory,

social exchange theory, and expectancy theory. By examining the relationship between SBP and TI, this study adds to the existing literature.

Sustainable business practices

SBP can be defined as the various methods and actions that organizations adopt to integrate environmental, social, and economic considerations into their operations and decision-making processes (Iqbal, 2020). These practices go beyond mere regulatory compliance and aim to create shared value for all stakeholders by proactively minimizing negative environmental impacts, promoting social responsibility, and ensuring long-term economic viability (Lombardi Netto et al., 2021). Effective human resource management is vital for the long-term sustainability of organizations. Implementing green HRM programs has been proven to be a successful strategy in reducing costs, improving resource efficiency, minimizing carbon footprint, enhancing employee engagement and environmental awareness, elevating environmental performance, and boosting corporate reputation (Wajdi et al., 2023).

It is essential for managers to pursue ethical practices in all aspects of their activities and participate in sustainable management. A fundamental aspect of sustainable HRM involves cultivating a workplace culture that prioritizes openness and respect, as well as fostering relationships of trust with employees (Thai & Mai, 2023). Additionally, it is crucial to emphasize the voice and participation of employees in order to create a sustainable HRM framework (Stadler et al., 2022). Organizations must incorporate sustainability and productivity issues in performance assessments with greening incentives to demonstrate their support for human resource practices. The integration of employees' green behaviors, green HRM practices, and environmental sustainability leads to new ways of performance in organizations with a focus on sustainability (Iqbal, 2020; Mehrez & Bakri, 2019). Leadership emphasis, message credibility, peer involvement, and employee empowerment are critical factors that drive a green organizational culture (Benn et al., 2015). These key enablers can significantly contribute to the success of an organization's sustainability efforts and help in achieving its environmental goals (Roscoe et al., 2019). The adoption of sustainable human resource management (HRM) practices is an essential factor in achieving long-term organizational benefits (Abu Mahfouz et al., 2023). This approach enables the implementation of effective well-being policies and initiatives that promote the continuous health and wellness of the workforce, which in turn enhances the organization's reputation as a preferred employer (Stadler et al., 2022). By adopting SBP, organizations can demonstrate their commitment to environmental and social responsibility while achieving their business

objectives (Apostu & Gigauri, 2023). Moreover, the focus on sustainability can lead to new opportunities for innovation and competitive advantage. These strategies underscore the importance of sustainable business practices in achieving long-term profitability (Duong et al., 2022). In particular, such programs can be considered as a retention strategy to discourage employees from leaving by making the organization a more attractive and sustainable place to work.

SBP are based on fundamental principles that support sustainable development. These principles are centered on environmental stewardship (Ning et al., 2023), social equity (Custodio et al., 2023), economic prosperity (Chen et al., 2023), and intergenerational responsibility (Fischer et al., 2023). Organizations that embrace SBP principles concentrate on several crucial aspects, such as efficiency, consistency, and sufficiency of resources (Fischer et al., 2023), waste reduction (Kumar et al., 2023), ethical labor practices (Lu et al., 2023), responsible sourcing (Rehman et al., 2023), community involvement (Bonfanti et al., 2023), renewable energy usage (Brychko et al., 2023; Caglar & Askin, 2023), and stakeholder engagement (Galati & Adamashvili, 2023). These components present a holistic approach to sustainable business management. By implementing SBP, organizations can maintain a profit, while solving environmental and social problems (Tura et al., 2019).

The theoretical foundations of SBP are grounded in sustainability and organizational theories. Sustainability theories provide a robust framework for understanding the rationale and implications of SBP. For instance, the triple bottom line (TBL) theory proposed by Elkington in 1994 (Elkington, 2004) emphasizes the importance of considering environmental, social, and economic dimensions when making organizational decisions to promote sustainable practices (Andersson et al., 2022; Mheiri et al., 2021). Distinguishing between sustainable practices helps to determine their influence on different competitive outcomes. The TBL theory's emphasis on considering environmental, social, and economic dimensions aligns well with the goals of sustainable business practices. However, a potential limitation lies in the challenge of effectively balancing these dimensions (Tavanti, 2023), as organizations may face trade-offs between profitability and sustainability, which could impact employee perceptions and TI.

The natural resource-based view (NRBV) posits that organizations that prioritize sustainability actions and outcomes, particularly those that focus on resource efficiency and conservation, are well-positioned to develop unique competitive advantages. Through the optimization of resource use, waste reduction, and preservation of natural resources, organizations can lower costs, enhance their environmental performance, and attract environmentally conscious customers and stakeholders. This strategic

emphasis on sustainability enables organizations to differentiate themselves, establish a positive reputation, and access new market opportunities, resulting in heightened competitiveness and long-term viability (Ahmadi-Gh & Bello-Pintado, 2022). The NRBV perspective provides valuable insights into the competitive advantages of prioritizing sustainability actions. By focusing on resource efficiency and conservation, organizations can lower costs and enhance environmental performance. However, the practical implementation of these strategies might involve upfront costs or changes that could potentially affect employee job satisfaction and TI.

By incorporating institutional theory as an additional theoretical framework, the understanding of sustainability and its connection to organizational practices can be enhanced. The institutional theory provides a comprehensive structure for analyzing the adoption of sustainable practices by organizations in the face of external pressures and internal expectations driven by coercive, normative, and mimetic isomorphism (DiMaggio & Powell, 1983; Glover et al., 2014). It justifies the adoption of certain sustainability practices, even when the benefits may not be immediate. The institutional theory considers the dissemination of management practices and organizational structures, taking into account social networks and legitimacy aspects. It emphasizes the importance of adopting practices or structures to gain legitimacy within the institutional environment. By examining the stimuli that contribute to sustainability and organizational legitimacy, including regulations, environmental concerns, social expectations, and legal frameworks, the institutional theory provides valuable insights into the adoption and implementation of sustainable practices within organizations. Previous research on sustainability-related topics, including environmental sustainability, sustainable methodologies, blockchain integration, and sustainable supply chains, has recognized the significance of the institutional theory in analyzing sustainability (Dragomir et al., 2023; Hussain et al., 2023). Incorporating the institutional theory enhances the understanding of sustainability adoption within organizations. While the theory highlights the importance of gaining legitimacy through sustainable practices, it might not fully account for individual employee motivations and attitudes that influence TI (Ren et al., 2023).

The resource-based view (RBV) theory offers valuable guidance for identifying organization resources that are suitable for green innovation incorporation into practices, processes, and activities. This enables organizations to redefine productivity and communicate their environmental sustainability efforts through green marketing campaigns (Khanra et al., 2022). By leveraging eco-branding (Olsen et al., 2014), green information technology (Chan, 2021), and green human resource management as

organization resources (Emmanuel et al., 2021; Roscoe et al., 2019), organizations can transform their brand image and develop sustainable organizational capabilities, contributing to long-term sustainability and competitive advantage (Khanra et al., 2022). The RBV theory's focus on identifying suitable resources for green innovation and transformation aligns with the notion of leveraging sustainable practices to create a competitive advantage. However, the potential challenge lies in the alignment of these resources with employees' values and perceptions, which can impact their intention to stay or leave the organization (Singh et al., 2022).

Stakeholder theory (ST) further enhances sustainable business practices for achieving social sustainability by emphasizing mutual benefits for all stakeholders and collaboration among supply chain tiers (Kausar Azam et al., 2023; Freeman, 1994). This framework aligns with the goals of sustainable business practices, especially in low- and middle-income countries (LMIC), where stakeholder theory underscores the importance of considering the opinions and expectations of stakeholders to achieve successful organizational outcomes. To achieve sustainable development goals (SDGs), high involvement, long-term commitment, and collaboration among supply chain tiers are necessary, and ST facilitates this transition from linear to circular economy practices. Social partnerships play a crucial role in managing collaborative interactions and contributing to the achievement of SDGs in LMICs (Kayikci et al., 2022). ST's emphasis on collaboration and mutual benefits aligns with the positive outcomes of sustainable practices, such as enhanced employee engagement and well-being. Nevertheless, the theory may not fully address the potential conflicts or differing stakeholder expectations that could contribute to TI.

Organizational support theory (OST) provides valuable insights into employees' perceptions of the support and concern shown by their organization, commonly known as perceived organizational support (POS) (Kurtessis et al., 2017). When employees feel supported, they are more likely to exhibit job commitment, improve their performance, and demonstrate loyalty to the organization. By recognizing and appreciating employees' contributions, organizations can boost their confidence, meet their need for recognition, and foster stronger social connections (Emmanuel et al., 2021; Hoyos & Serna, 2021). While OST emphasizes the significance of perceived organizational support in comprehending TI, one may question its validity in accounting for external factors that could also impact TI. While fostering a supportive work environment is undoubtedly important, there may be other factors at play that need to be considered.

Integrating these theoretical foundations allows organizations to develop a comprehensive understanding of SBP and their implications for

sustainable development. This framework provides a valuable perspective for exploring the relationship between SBP and TI, unraveling the underlying mechanisms and factors that shape employees' attitudes and behaviors toward sustainability within the organizational context. Understanding these dynamics is crucial for organizations striving to enhance employee retention and create a culture of sustainability and shared values.

Turnover intention (TI)

TI refers to the predisposition or aspiration of an employee to voluntarily resign from their present job or organization (Ali et al., 2022). Understanding TI is essential for organizations to formulate strategies that aid talent retention. Several factors influence TI, including job satisfaction (Ayodele et al., 2022; Barkhuizen & Gumede, 2021; Barthauer et al., 2020), burnout (Barthauer et al., 2020), organizational commitment (Ali et al., 2022; Benn et al., 2015), work-life balance (Ayodele et al., 2022), interpersonal conflict (De Clercq & Belausteguigoitia, 2022); happiness, management support, co-worker support, career management, innovative work behavior, and leader member exchange (Kanchana & Jayathilaka, 2023), as well as, the importance of considering individual differences between groups of employees and their perception of the extrinsic and intrinsic rewards received (Hoyos & Serna, 2021).

The concept of TI can be viewed through various theoretical lenses, including job embeddedness theory, social exchange theory, and expectancy theory. Each of these perspectives offers valuable insights into understanding the factors that influence employees' intentions to leave their current job or organization.

Job embeddedness theory (JET) encompasses three key dimensions: "links," "fit," and "sacrifice." The theory emphasizes the importance of individuals' connections to their physical surroundings, family, community, and work environment, suggesting that the more embedded employees are in these various domains, the lower their intention to quit. Additionally, JET highlights the significance of the individual's sense of compatibility with the organization and its surroundings (fit) and the perceived costs associated with leaving the job (sacrifice). By understanding and addressing these dimensions, organizations can effectively manage TI and enhance employee retention (Arici et al., 2023).

Social exchange theory (SET), proposed by Blau (1964) and Emerson (1976) (Cook, 2015), offers a valuable framework for understanding the reciprocal relationship between leaders and subordinates in organizations. According to Li et al. (2022), SET highlights that the quality of this relationship

influences outcomes. Negative treatment from abusive leaders, characterized by a lack of trust, respect, support, and mistreatment, can lead employees to exhibit poor behaviors and experience exhaustion and insecurity. Previous research has shown that SET effectively explains abusive behaviors and their negative impact in the workplace. It has also been applied to study factors such as job insecurity and emotional exhaustion. Considering the principles of SET can provide insights into how leader member relationships and employee experiences shape outcomes like TI (Li et al., 2022).

Understanding how individuals make decisions and what rewards they expect is crucial for organizations to retain their employees. Expectancy theory (Vroom, 1964) is a valuable tool that sheds light on this topic. The theory's sub-constructs, namely expectancy, instrumentality, and valence, play a significant role in influencing TI. When employees feel that their efforts will not be adequately rewarded, they might consider leaving the organization. Similarly, if good performance is not recognized or rewarded, employees may become disengaged and more likely to leave. Lastly, rewards that are not deemed personally valuable can also lead to higher TI. By identifying areas that need improvement and taking appropriate actions, organizations can reduce turnover and retain their valuable employees (Gyepi-Garbrah et al., 2023).

Understanding these theoretical perspectives can help organizations develop effective strategies to reduce TI and enhance employee retention within the context of SBP.

The rationale for investigating the relationship between sustainable business practices and turnover intention

Investigating the relationship between SBP and TI holds several compelling reasons. The implementation of SBP in an organization demonstrates its dedication toward ethical and responsible behavior, which is essential in creating a positive work environment. This, in turn, leads to higher levels of job satisfaction, organizational commitment, and employee loyalty (Silva et al., 2022). SBP benefits not only the organization but also the environment and society as a whole, by promoting employee engagement, empowerment, and well-being (Lu et al., 2023). Understanding how SBP affects employee perceptions and intentions toward turnover provides insights into employee retention and overall organizational performance.

A critical aspect of SBP is addressing deceptive practices, such as greenwashing, which can negatively impact employee trust and commitment, leading to higher turnover rates (Westerman et al., 2022). The presence of greenwashing undermines the authenticity of an organization's

sustainability efforts and creates skepticism and cynicism among employees, ultimately contributing to disengagement and higher turnover rates. To combat greenwashing, organizations need to foster an authentic culture of sustainability and ethical behavior, which in turn, can help maintain employee trust, reduce TI, and enhance overall organizational performance.

Effective retention strategies are essential for long-term organizational success, as retaining skilled and motivated employees is crucial (Barkhuizen & Gumede, 2021). To cultivate a workforce committed to sustainable practices, organizations can integrate theoretical foundations of SBP and TI to develop effective strategies that address TI and enhance employee retention rates. This approach can lead to sustainable growth for the organization. After conducting a systematic literature review (SLR) of 31 papers, a robust theoretical basis has been established for connecting SBP with TI.

While numerous theories provide insightful frameworks for understanding the dynamics between SBP and TI, it is crucial to recognize some critiques in the field. Some contentions suggest that certain sustainability practices, although well-presented, might predominantly serve symbolic purposes rather than effect real change (Rodrigue et al., 2013; Newig, 2007). Additionally, while the discussed theories capture a broad spectrum of factors influencing TI, there could be external determinants beyond these theoretical boundaries. This study endeavors to navigate these critiques, aiming to shed light on the intricate relationship between SBP and TI with a well-rounded perspective.

METHODOLOGY

To comprehensively understand the intricate relationship between sustainable business practices (SBP) and turnover intention (TI), this research employed a systematic literature review (SLR) approach. This methodology is informed by a commitment to methodological rigor and precision, ensuring a robust foundation for the research findings and conclusions.

Selection of the data source

The decision to utilize the Scopus database for the literature review was informed by its esteemed standing as a premier repository for scholarly content. Scopus is distinguished by its comprehensive depth, encompassing over 76 million records that span more than 24,000 journals, books, and conference proceedings. Its wide-ranging coverage across a myriad of academic disciplines, which is augmented by advanced analytical capabilities, positions Scopus as an indispensable resource for researchers seeking

a comprehensive exploration of academic narratives. Our predilection for Scopus, particularly when juxtaposed with databases such as the Web of Science (WoS), is anchored in its unparalleled breadth in academic literature, making it a quintessential tool for investigations necessitating an exhaustive traversal of scholarly discourse. However, it is imperative to acknowledge the inherent constraints of confining our search to a singular database. There exists the potentiality of omitting specialized articles or those originating from specific geographic locales. We recognize this constraint and advocate for subsequent research initiatives to contemplate the integration of diverse databases to achieve a more expansive literary canvas.

Our exploration into the Scopus database was initiated on March 29th, 2023. The term “sustainab*” was employed to target titles, abstracts, and keywords, yielding an initial expansive pool of 903,595 articles. A thorough search term was utilized to gather articles on SBP, encompassing different versions of the term “sustainable.” To narrow down the research objectives, extra search terms were included using the connector “AND,” such as “turnover intention” and “job satisfaction,” to explore the connections amongst SBP, employee contentment, and TI. By incorporating these extra search terms, the number of articles was reduced to 974, enabling a more precise study of the subject matter. It is worth noting that a search using only “sustainab*” and “turnover intention” produced 1,670 results. However, for a more comprehensive literature analysis, the search term “job satisfaction” was deemed necessary. This deliberate approach enabled a more focused investigation of the research trends and insights surrounding SBP and TI in our study.

Refinement process and criteria implementation

To refine this vast collection, strategic and well-defined parameters were set:

- **Inclusion criteria:** Only articles that:
 - 1) Were published within the past decade (2013-2023).
 - 2) Were authored in English.
 - 3) Appeared in peer-reviewed journals or conference proceedings in the realms of business, management, and accounting.

 - **Exclusion criteria:** Articles were discarded if they:
 - 1) Deviated from the core research theme.
 - 2) Were not peer-reviewed.
 - 3) Were not authored in English.
 - 4) Were published prior to our defined ten-year window.
-

After meticulous application of these criteria, a refined list of 326 articles was procured for further assessment.

Quality assessment and PRISMA Statement adherence

Our commitment to academic rigor was further underpinned by our adherence to the PRISMA Statement, ensuring a systematic and transparent review process (Figure 1):

- 1) **Identification:** This phase captured the initial array of articles from Scopus.
- 2) **Screening:** From the initial pool of 326 articles, an automated process within Covidence detected and removed a singular duplicate, resulting in 325 articles for evaluation. Utilizing a double-blind review protocol, two independent reviewers meticulously assessed the titles and abstracts of these articles. Their assessments were anchored by two guiding research questions:
 - a) Does the article present key findings or topics related to the relationship between sustainable business practices (SBP) and turnover intention (TI)?
 - b) Does it explore variables that might mediate or moderate this relationship?

Articles were considered to be out of scope if they purely discussed SBP without referencing TI, or vice versa. This rigorous screening ensured that only articles closely aligned with our research objectives advanced to the next stage. In instances where the reviewers held different perspectives on an article's relevance, a structured dialogue ensued. Through collaborative deliberation, discrepancies were resolved, ensuring that the screening process was both consistent and comprehensive.

- 3) **Eligibility:** The 61 articles that passed the screening stage were then subjected to a thorough full-text review. This deeper dive, carried out by the same two blind reviewers, examined the entirety of each article to ascertain its depth, methodological rigor, and precise relevance to the relationship between SBP and TI. Articles were judged not only by their overt discussions of SBP and TI but also by their exploration of potential mediating or moderating variables — directly in line with the second research question. Given the granular nature of this review, the likelihood of divergent opinions between the reviewers increased. In such situations, the reviewers engaged in a constructive dialogue, revisiting the research questions and inclusion criteria to reach a consensus, ensuring that the final selection was the epitome of academic rigor.
- 4) **Inclusion:** The exhaustive evaluation process resulted in a final selection of 31 articles that met stringent criteria and warranted a thorough examination.

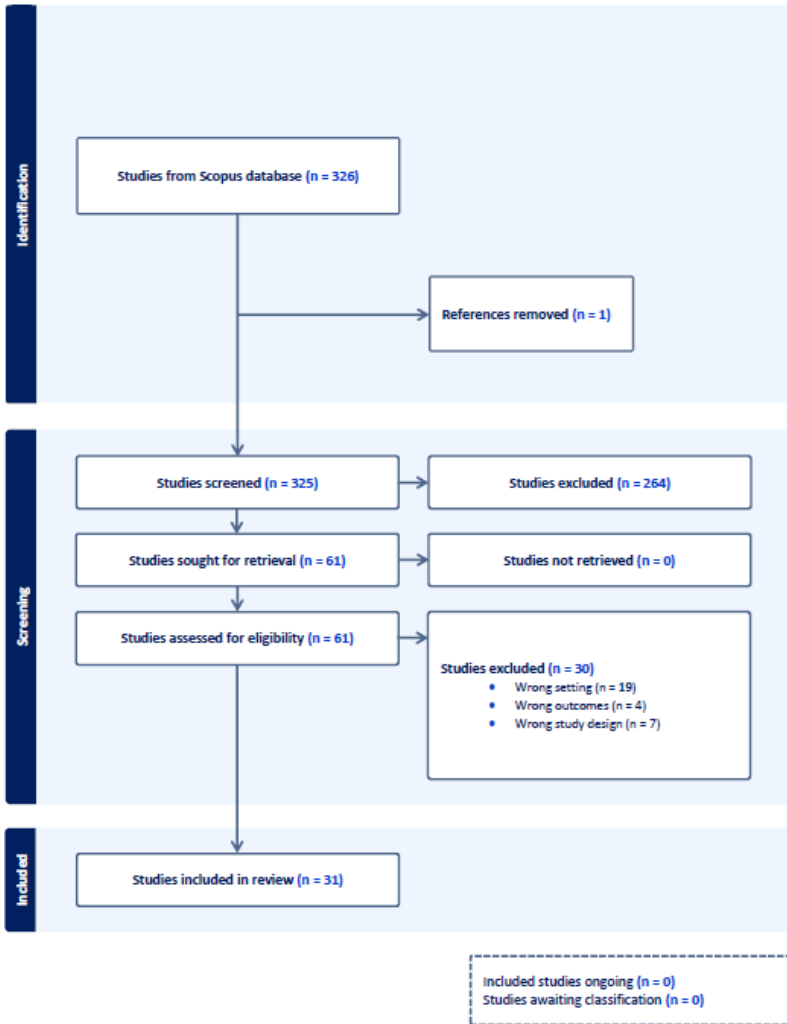


Figure 1. Papers quality assessment and double-blinded screening based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement for transparent reporting.

Source: Authors' elaboration based on Covidence and the Scopus dataset.

PRISMA Statement role in the research

PRISMA Statement is an internationally recognized guideline, providing a robust framework that ensures systematic reviews are transparent, comprehensive, and reproducible. It comprises a checklist and flow diagram

that detail the systematic review process, from the literature search and screening to the final selection of articles. Our strict adherence to the PRISMA Statement ensures that each phase of our research, from the identification of relevant articles to their inclusion or exclusion, is meticulously documented, enhancing the transparency and credibility of our methodology.

Data synthesis, analysis, and the role of Covidence

Among the 31 articles selected, a rigorous thematic synthesis was conducted to elucidate dominant patterns, emergent themes, and intricate nuances related to SBP and TI. This analytical endeavor not only foregrounded salient findings but also underscored discernible gaps in contemporary scholarship, suggesting directions for future research. In our pursuit of methodological rigor and to optimize the systematic review process, we incorporated Covidence, an esteemed digital platform dedicated to systematic reviews. Covidence was indispensable, providing invaluable support from the preliminary screening stages to data extraction and the conclusive analytical phase.

While our systematic review has yielded rich insights, we understand the inherent limitation of relying exclusively on Scopus. Though Scopus provides a comprehensive coverage, the incorporation of other databases might have rendered a broader spectrum of literature, capturing more nuanced or regional perspectives. We acknowledge this limitation and suggest that future studies might expand their literature search across multiple databases to ensure even more extensive coverage.

RESULTS AND DISCUSSION

In this section, the results and discussion are presented, which derived from the comprehensive analysis of 31 papers using a SLR approach, following the PRISMA Statement. Through a rigorous process, the study has identified both the findings and authors that significantly contribute to the understanding of the relationship between SBP and TI. The results and discussion have been subdivided into subsections based on the logical structure of the four research questions.

RQ1. What are the key findings and topics found, based on the SLR regarding the relationship between sustainable business practices and turnover intention?

Based on the results of the 31 articles reviewed, key findings were found, organized into three thematic groups, and presented in Table 1 as (1) Job-related factors affecting TI, (2) Organizational support and leadership impacting TI, and (3) Employee engagement, satisfaction, and ethical factors influencing TI.

In the first thematic group, the identified job-related factors affecting TI include pay, employment relationship, employee welfare, career growth, and workplace ethics (Ayodele et al., 2022). Addressing these factors can reduce turnover rates by improving employee satisfaction and commitment. Furthermore, departmental support was found to have a buffering effect on burnout and career satisfaction (Barthauer et al., 2020). While it positively impacts employee engagement, it may negatively influence career-related factors.

Transformational leadership was found to reduce TI by fostering a psychologically safe work environment (Sobaih et al., 2022). Other factors such as pay, supervisor satisfaction, work satisfaction, and promotion satisfaction were found to impact both employee engagement and TI (Wen et al., 2022). The correlation between perceived CSR and ethical leadership was explored, emphasizing the mediating role of job satisfaction (Nejati et al., 2021). Moreover, implementing green human resource management mechanisms and aligning HRM practices with sustainability goals enhanced employee retention (Adeyefa et al., 2021; Guerci et al., 2019). Cultivating other-oriented attributions and fostering a culture of social responsibility were also identified as factors influencing TI (Lu et al., 2023; Valyte-Zeimiene & Buksnyte-Marmiene, 2022). Additionally, sustainable HRM practices were found to be essential in addressing unsustainable work practices and reducing turnover in the events industry (Stadler et al., 2022).

In the second thematic group, perceived organizational support toward the environment was found to positively relate to job satisfaction, organizational identification, and citizenship behaviors toward the environment and negatively related to TI (Lamm et al., 2015). Through perceived organizational support, leader-member exchange influenced TI (Huang et al., 2021). Effective communication and active listening skills of supervisors were also found to impact emotional exhaustion, citizenship behavior, and TI (Lloyd et al., 2015).

Table 1. Key Findings on the Relationship between SBP and TI

Thematical Group	Key Findings
1. Job-Related Factors Affecting TI	<p>Factors such as pay, employment relationship, employee welfare, career growth, and workplace ethics affect employees' intention to leave their job. Addressing these factors can reduce turnover rates (Ayodele et al., 2022).</p> <p>Employees who feel supported by their department have a lower risk of burnout and higher levels of perceived internal marketability and career satisfaction. However, this support does not reduce the likelihood of employees intending to leave their current job. These results suggest that departmental support can positively impact employee engagement but may negatively affect career-related factors (Barthauer et al., 2020).</p> <p>Transformational leadership negatively affects employee TI in the hotel industry. This effect is mediated by psychological safety, indicating that transformational leadership practices can help reduce employee turnover by fostering a psychologically safe work environment (Sobaih et al., 2022).</p> <p>Several factors, including pay, supervisor satisfaction, work satisfaction, and promotion satisfaction, significantly impact employee engagement. On the other hand, these same factors have a negative impact on TI. This underscores the importance of these factors in fostering employee engagement and reducing turnover rates (Wen et al., 2022).</p> <p>The correlation between perceived CSR and ethical leadership in preventing employee TI has been examined in this study. The findings suggest that job satisfaction acts as a mediator in this relationship. As a result, organizations should focus on implementing CSR and ethical leadership practices to enhance job satisfaction and ultimately minimize employee TI (Nejati et al., 2021).</p> <p>Implementing green human resource management mechanisms can significantly enhance employee retention in the hotel industry. This study emphasizes the significance of integrating environmentally sustainable practices within HRM strategies to decrease turnover rates (Adeyefa et al., 2021).</p> <p>Sustainable HRM has been found to have a positive effect on job satisfaction, while also decreasing TI. It was observed that the meaning of work mediates the relationship between sustainable HRM and job satisfaction. Therefore, organizations must ensure that their HRM practices align with sustainability goals to foster job satisfaction and decrease TI (Guerci et al., 2019).</p> <p>Employees with other-oriented attributions toward socially responsible organizations are less inclined to have TI and view the organization as fair. These findings indicate that promoting other-oriented attributions and cultivating a culture of social responsibility can positively impact TI (Valyte-Zeimiene & Buksnyte-Marmiene, 2022).</p> <p>Employee-oriented social responsibility is related to reducing TI, mediated by the dimensions of organizational commitment. This indicates that organizations should prioritize employee-oriented social responsibility practices to enhance organizational commitment and reduce turnover rates (Lu et al., 2023).</p> <p>There is a necessity for sustainable HRM practices in the events industry to address unsustainable work practices, workload, and employee relationships and prevent high levels of turnover. This emphasizes the importance of implementing sustainable HRM strategies tailored to the specific industry context (Stadler et al., 2022).</p>
2. Organizational Support and Leadership Impacting TI	<p>Perceived organizational support toward the environment positively relates to job satisfaction, organizational identification, and citizenship behaviors toward the environment while negatively relating to TI. This indicates that organizations that support environmental initiatives can positively influence employee attitudes and reduce TI (Lamm et al., 2015).</p> <p>A causal link exists between leader-member exchange and TI through perceived organizational support. This finding underscores the significance of leader-member relationships and the perceived level of support from the organization in influencing TI (Huang et al., 2021).</p> <p>Supervisors who were perceived as good listeners had a positive effect on emotional exhaustion, citizenship behavior, and TI. This implies that supervisors' effective communication and active listening can play a critical role in reducing TI (Lloyd et al., 2015).</p> <p>The practice of ethical leadership has a positive impact on employee rewards and has an indirect effect on reducing TI among Gen-Y employees in Malaysia. This emphasizes the crucial role that ethical leadership practices play in promoting favorable employee outcomes and diminishing the likelihood of TI (Ng & Salamzadeh, 2020).</p> <p>The study highlights the significance of servant leadership in mitigating TI among employees in the higher education sector of Pakistan. The findings suggest that the adoption of servant leadership behaviors can have a beneficial impact on employee retention rates (Mustamil & Najam, 2020).</p>

Thematical Group	Key Findings
3. Employee Engagement, Satisfaction, and Ethical Factors Influencing TI	<p>Research has shown that sustainable HRM practices and good internal communication can improve employees' feelings about their organization. This can lead to better performance and less desire to leave their job. Essentially, by making sure employees are happy and committed, companies can reduce turnover rates (Gomes et al., 2023).</p> <p>The presence of a causal relationship path from CSR to job satisfaction, followed by organizational commitment, can lead to a decrease in TI. This suggests that companies prioritizing CSR initiatives can positively impact employee satisfaction and commitment, reducing turnover intent (Jarkovská & Jarkovská, 2022).</p> <p>The impact of organizational justice on employees' intention to stay is both direct and indirect, as it affects their level of organizational commitment. This highlights the significance of prioritizing organizational justice to increase organizational commitment and decrease TI (Mahfouz et al., 2022).</p> <p>Career competencies impact organizational commitment, job involvement, and TI, with job involvement and organizational commitment partially mediating these relationships. This suggests that developing employees' career competencies can positively influence job satisfaction and organizational commitment and ultimately reduce TI (Ali et al., 2022).</p> <p>Perceived greenwashing has negative relationships with sustainability managers' job satisfaction, affective commitment, job performance, and a positive relationship with TI. SDG identity congruence moderates these effects, with higher SDG identity leading to enhanced job satisfaction, commitment, and lower TI in the presence of greenwashing rates (Westerman et al., 2022).</p>

The practice of ethical leadership was positively linked to employee rewards and had an indirect effect on reducing TI (Ng & Salamzadeh, 2020). Servant leadership was found to mitigate TI in the higher education sector (Mustamil & Najam, 2020) and job performance (Bieńkowska et al., 2023).

The third thematical group highlighted the role of sustainable HRM practices, internal communication, and CSR initiatives in enhancing employees' attitudes toward the organization, reducing TI, and improving performance (Gomes et al., 2023; Jarkovská & Jarkovská, 2022). The impact of organizational justice on TI was observed through its influence on organizational commitment (Mahfouz et al., 2022). Career competencies were found to impact organizational commitment, job involvement, and TI, with job involvement and organizational commitment partially mediating these relationships (Ali et al., 2022). One study explored how perceived greenwashing affects the job satisfaction, commitment, performance, and TI of sustainability managers. The findings revealed a positive correlation between perceived greenwashing and TI. However, the study also found that having a strong Sustainable Development Goals (SDG) identity can mitigate these effects by enhancing job satisfaction, commitment, and reducing TI, despite the prevalence of greenwashing practices (Westerman et al., 2022).

RQ2: How do certain variables mediate or moderate the relationship between sustainable business practices and turnover intention?

The aim is to reveal the complex dynamics and contextual factors affecting the SBP and TI relationship. This is achieved by presenting the mediating and moderating variables, which help to uncover the underlying processes and conditions that drive the impact of SBP on TI. With a better understanding of these variables, organizations can develop targeted strategies and

interventions that are tailored to their specific industry, culture, and context. By doing so, they can effectively manage TI and promote SBP that are aligned with their objectives. To effectively address RQ2, it is crucial to consider the variables that mediate or moderate the relationship between SBP and TI across the three groups presented earlier as a response to RQ1. These variables are presented in Table 2.

Table 2. Variables that mediate or moderate the relationship between SBP and TI

Mediator Factors	Moderator Factors
Group 1: Job-Related Factors Affecting TI	
<ul style="list-style-type: none"> • Job satisfaction: Mediates the relationship between perceived corporate social responsibility (CSR) and ethical leadership with TI (Nejati et al., 2021). • Meaning of work: Mediates the relationship between sustainable HRM practices and job satisfaction, which in turn affects TI (Guerci et al., 2019). 	<ul style="list-style-type: none"> • Psychological safety: Moderates the relationship between transformational leadership and TI. Transformational leadership practices foster psychological safety, which moderates the impact on reducing TI in the hotel industry (Sobaih et al., 2022). • Organizational commitment: Moderates the relationship between employee-oriented social responsibility and TI. Employee-oriented social responsibility practices have a stronger impact on reducing TI rates when organizational commitment is higher (Lu et al., 2023).
Group 2: Organizational Support and Leadership Impacting TI	
<ul style="list-style-type: none"> • Perceived organizational support toward the environment: Mediates the relationship between organizational support toward the environment and TI (Lamm et al., 2015) • Perceived organizational support: Mediates the relationship between leader-member exchange and TI (Huang et al., 2021). 	<ul style="list-style-type: none"> • Effective communication and active listening: Moderates the relationship between supervisors' listening skills and TI (Lloyd et al., 2015). • Ethical leadership: Moderates the relationship between employee rewards and TI (Ng & Salamzadeh, 2020). • Servant leadership: Moderates TI in the higher education sector (Mustamil & Najam, 2020).
Group 3: Employee Engagement, Satisfaction, and Ethical Factors Influencing TI	
<ul style="list-style-type: none"> • Organizational commitment: Mediates the relationship between sustainable HRM practices, CSR initiatives, and job satisfaction with TI (Gomes et al., 2023; Jarkovská & Jarkovská, 2022; Mahfouz et al., 2022). • Job involvement: Partially mediates the relationship between career competencies and TI (Ali et al., 2022). 	<ul style="list-style-type: none"> • SDG identity congruence: Moderates the effects of perceived greenwashing on job satisfaction, commitment, and TI. Higher SDG identity enhances job satisfaction, commitment, and reduces TI in the presence of greenwashing rates (Westerman et al., 2022).

In Group 1, which focuses on job-related factors affecting TI, several variables emerge as mediators and moderators. Job satisfaction is identified as a crucial mediator, mediating the relationship between perceived CSR and ethical leadership with TI (Nejati et al., 2021). Additionally, the meaning of work acts as a mediator, mediating the relationship between sustainable HRM practices and job satisfaction, which in turn affects TI (Guerci et al., 2019). On the other hand, psychological safety acts as a moderator, moderating the relationship between transformational leadership and TI. It fosters a sense of safety and trust, thus reducing TI in the hotel industry (Sobaih et al., 2022). Organizational commitment also acts as a moderator, moderating the relationship between employee-oriented social responsibility and TI. The impact of employee-oriented social responsibility practices on reducing TI rates is stronger when organizational commitment is higher (Gomes et al., 2023).

In Group 2, which explores organizational support and leadership impacting TI, mediator, and moderator variables play important roles. Perceived organizational support toward the environment acts as a mediator, mediating the relationship between organizational support toward the environment and TI (Lamm et al., 2015). Perceived organizational support also acts as a mediator, mediating the relationship between leader-member exchange and TI (Huang et al., 2021). Moreover, effective communication and active listening emerge as a moderator, moderating the relationship between supervisors' listening skills and TI (Lloyd et al., 2015). Ethical leadership (Ng & Salamzadeh, 2020) and servant leadership (Mustamil & Najam, 2020) also act as moderators, moderating the relationship between employee rewards and TI, as well as TI in the higher education sector, respectively.

In Group 3, which focuses on employee engagement, satisfaction, and ethical factors influencing TI, several mediator and moderator variables come into play. Organizational commitment acts as a mediator, mediating the relationship between sustainable HRM practices, CSR initiatives, and job satisfaction with TI (Gomes et al., 2023; Jarkovská & Jarkovská, 2022; Mahfouz et al., 2022). Similarly, job involvement partially mediates the relationship between career competencies and TI (Ali et al., 2022). SDG identity congruence emerges as a crucial moderator, moderating the effects of perceived greenwashing on job satisfaction, commitment, and TI. Higher SDG identity enhances job satisfaction, commitment, and reduces TI in the presence of greenwashing rates (Westerman et al., 2022).

In conclusion, the findings from the three groups of factors highlight the complex relationship between SBP and TI. The mediating factors identified by Gomes et al. (2023), Guerci et al. (2019), Huang et al. (2021), Nejati et al. (2021), Sobaih et al. (2022), and Ali et al. (2022) reveal the importance

of variables such as job satisfaction, the meaning of work, organizational commitment, perceived organizational support toward the environment, and perceived organizational support in explaining the mechanisms through which various factors influence TI. Moreover, the moderating factors examined by Lloyd et al. (2015), Lu et al. (2023), Mustamil and Najam (2020), Ng and Salamzadeh (2020), Sobaih et al. (2022), and Westerman et al. (2022) demonstrate the role of psychological safety, organizational commitment, effective communication, ethical leadership, servant leadership, and SDG identity congruence in shaping the relationship between SBP and TI. These factors provide a nuanced understanding of how specific conditions and contexts influence the impact of SBP on TI.

Taking a holistic approach to consider mediated and moderated factors can help organizations gain a comprehensive understanding of the underlying mechanisms at play when it comes to addressing TI effectively. The factors that have been identified show the importance of fostering job satisfaction, promoting organizational commitment, creating a meaningful work environment, enhancing communication, providing perceived organizational support, cultivating ethical leadership practices, and aligning employees' values with sustainability goals. By focusing on these key areas, organizations can develop targeted strategies that help them tackle TI in a more effective manner.

RQ3: What are the key patterns, trends, and gaps in the relationship between sustainable business practices and turnover intention?

After rigorous analysis of 31 literature papers, patterns, trends, and gaps were identified related to the impact of SBP on employees' job retention. This analysis has provided valuable insights into the relationship between SBP and TI, which can guide organizations in fostering sustainable practices while reducing employee turnover. Further exploring this relationship can enhance our understanding of how SBP affects TI.

The presented key findings in response to RQ1 have revealed certain patterns, trends, and gaps, which can aid in addressing RQ3:

Patterns

Several consistent patterns emerged from the analysis, highlighting the relationship between SBP and TI. These patterns highlight the benefits associated with sustainable Human Resource Management (HRM) practices, the mediating role of certain variables, and the importance of employee involvement and empowerment in sustainable HRM:

- 1) **Positive impact of sustainable HRM:** Many of the key findings indicate a positive relationship between sustainable HRM practices and various employee outcomes, such as reduced TI, increased job satisfaction, and enhanced organizational commitment. This suggests a consistent pattern of the benefits associated with implementing sustainable HRM practices.
- 2) **Mediating variables:** Several studies highlight the mediating role of variables like employee engagement, job satisfaction, and organizational commitment. This pattern suggests that these variables play an important role in translating the effects of sustainable HRM practices on TI and employee retention.
- 3) **Employee involvement and empowerment:** Employees consistently emerge as significant mediators or factors influencing the relationship between sustainable HRM practices and TI. This pattern suggests that empowering employees and involving them in decision-making processes are crucial aspects of sustainable HRM.

Trends

Apart from the identified patterns, certain trends were observed in the literature, indicating evolving perspectives and areas of focus in the relationship between SBP and TI:

- 1) **Focus on environmental performance:** There is a growing trend in exploring the relationship between environmental performance and employee outcomes. The findings suggest that a positive relationship exists between environmental performance and employee satisfaction, well-being, and retention. This indicates an increasing recognition of the importance of environmental sustainability and its impact on employee attitudes and behaviors.
- 2) **Role of intellectual capital:** Some studies emphasize the role of intellectual capital in shaping employees' responses to sustainable HRM practices. This trend suggests that organizations should consider the intellectual capital possessed by their employees as a valuable resource that can influence the effectiveness of sustainable HRM initiatives.

In conclusion, the literature analysis has provided valuable insights into the relationship between SBP and TI. The identified patterns, such as the positive impact of SBP and the mediating role of variables, contribute to our understanding of effective strategies for reducing TI. The trends in environmental performance and intellectual capital underscore the importance of considering broader factors in sustainable organizational initiatives.

Research gaps

In addition to the patterns and trends, several research gaps were identified in the existing literature, indicating areas where further research is needed to enhance our understanding of the relationship between SBP and TI:

Research gap 1: Variation in sustainable business practices impact across industries and sectors

This gap emphasizes the need to understand how the impact of SBP on TI varies across different industries and sectors. Industries differ in terms of their organizational structures, job characteristics, employee expectations, and regulatory environments. There's a pressing need to explore whether the effects of SBP on TI are consistent across diverse industry settings or if there are industry-specific factors that moderate this relationship. Such exploration will enable organizations to tailor sustainable practices to the unique needs of different industries, ultimately contributing to enhanced employee retention strategies.

Research gap 2: Long-term effects of sustainable business practices on turnover intention

While existing research provides insights into the short-term impacts of SBP on TI, the sustainability of these effects over an extended period remains largely unexplored. Longitudinal studies that track employees' experiences and TI over time are imperative to decipher the lasting benefits and potential pitfalls of SBP. Insights from such long-term studies will guide organizations in formulating and refining sustainable strategies for enduring improvements in employee retention.

Research gap 3: Influence of cultural and contextual factors on sustainable business practices and turnover intention

Current findings predominantly reflect studies conducted in specific cultural and contextual settings, potentially limiting the generalizability of the results. There is an unexplored area in understanding how national culture, societal norms, legal frameworks, and other contextual variables shape employees' perceptions of and responses to sustainable practices. Investigating this gap will offer organizations insights into tailoring their SBP, ensuring alignment with cultural values and expectations.

Research gap 4: Methodology for cross-cultural research on sustainable business practices and turnover intention

To uncover both universal principles and cultural nuances influencing the effectiveness of sustainable practices, there is a need to design and execute rigorous cross-cultural research studies. Such studies can contrast the effects of SBP on TI across diverse cultural contexts. Multinational organizations, in particular, stand to benefit from this knowledge, guiding them in customizing their SBP to resonate with employees from varied cultural backgrounds.

Considering the identified gaps, based on our systematic literature review, we propose a set of hypotheses to further understand the nuanced dynamics between SBP and TI.

Derived hypotheses from the literature

Hypothesis 1 (H1): The impact of sustainable business practices on turnover intention will vary across industries and sectors.

Different industries and sectors exhibit distinct characteristics, practices, and work environments. These variations may impact the effectiveness of SBP in reducing TI. For instance, the impact of SBP on TI might differ between the technology sector and the healthcare sector due to differences in employee expectations and job characteristics.

Hypothesis 2 (H2): Organizations with robust sustainable business practices will experience lower turnover intention rates over time.

SBP encompass strategies that promote employee well-being, engagement, and organizational commitment. These practices, such as work-life balance programs, career development, and employee recognition, contribute to job satisfaction and reduced TI over time.

Hypothesis 3 (H3): National culture, societal norms, and legal frameworks directly moderate the sustainable business practices and turnover intention relationship.

Elements such as prevailing national values, societal expectations, and the legal environment within a region play a pivotal role in shaping the relationship between SBP and TI. The influence of these contextual factors may either enhance or mitigate the impact of SBP on TI.

Hypothesis 4 (H4): The sustainable business practices and turnover intention relationship varies across different cultural contexts.

The interplay between SBP and TI isn't universally consistent but varies based on the cultural milieu. Certain cultural contexts might amplify the positive effects of SBP on reducing TI, while others might lessen it. The hypothesis underscores the necessity of cross-cultural research to elucidate these variations.

By empirically testing these hypotheses and analyzing data across diverse industries and cultural contexts, a future research model intends to delve deeper into the intricate relationship between SBP and TI, and the overarching cultural/contextual factors. The insights derived will undoubtedly be invaluable for organizations in their quest to devise and implement sustainable business strategies, ensuring employee retention and well-being in varied settings.

In conclusion, the literature analysis has provided valuable insights into the relationship between SBP and TI. Addressing the identified gaps through industry-specific studies, longitudinal research, and cross-cultural investigations, will further enhance our understanding of the SBP-TI relationship and inform the development of targeted organizational interventions.

In order to enhance the analysis and address research gaps, we conducted a comprehensive geographical distribution and industry representation analysis. This information has been compiled in Appendix A1.

RQ4. What are potential future research directions to address the identified gaps and enhance understanding of the factors influencing turnover intention in the context of sustainable business practices?

Identifying gaps in the existing literature on the relationship between SBP and TI highlights the need for further research to enhance our understanding of the factors influencing TI in the context of SBP. This section presents potential future research directions across eight categories, offering an overview of different research areas and their related topics, and assists in addressing the RQ4 (Table 3).

This section outlines proposed research directions aimed at addressing gaps in the literature on SBP and TI. These categories, when explored, can help researchers understand the factors influencing TI in the context of SBP and provide valuable insights for organizations to develop effective strategies. The research questions provided can serve as a starting point for further

investigation, and doctoral students may approach the authors for detailed work plans corresponding to each research category.

Table 3. Future research directions

Categories	Research questions
C1: Factors influencing TI and retention strategies.	<ol style="list-style-type: none"> 1. What are the key components of a framework that effectively addresses labor turnover in the construction sector? 2. How do different turnover prediction models compare in terms of accuracy and applicability across various industries?
C2: Relationship between burnout, resources, and TI	<ol style="list-style-type: none"> 1. How does the Conservation of Resources Theory explain the relationship between burnout and TI in sustainable careers? 2. What is the impact of perceived external marketability on burnout and career TI?
C3: Mediating factors and actual turnover	<ol style="list-style-type: none"> 1. How do exogenous variables mediate the relationship between TI and actual turnover, and what are the underlying mechanisms? 2. To what extent does psychological safety mediate the relationship between various factors (e.g., organizational justice, job satisfaction) and employee TI?
C4: CSR and sustainable HRM practices	<ol style="list-style-type: none"> 1. How does CSR influence employees' behavior, attribution, and knowledge within organizations? 2. What is the role of HR managers in implementing and promoting sustainable HRM practices, and how does social legitimacy influence their effectiveness? 3. How do hospitality industry employees shape CSR and sustainable development?
C5: Organizational culture and employee outcomes	<ol style="list-style-type: none"> 1. How do ethical leadership, work-values fit, and organizational climate impact employees' TI? 2. How does organizational culture influence employee retention in the hospitality industry, and what are the underlying mechanisms? 3. In what ways do cultural values and societal norms moderate the relationship between sustainable business practices and TI across different regions?
C6: Sustainable careers and employee-oriented social responsibility	<ol style="list-style-type: none"> 1. How do employee-oriented social responsibility initiatives impact employee TI, and how do individual and organizational factors moderate this relationship? 2. How does CSR influence employee leadership and commitment, and how does this relationship contribute to sustainable careers?

Categories	Research questions
C7: Sustainability managers and greenwashing behavior	<ol style="list-style-type: none"> 1. How do stakeholders respond to greenwashing practices, and what are their attitudinal responses toward companies engaging in greenwashing? 2. What factors influence the behavior of sustainability managers in avoiding or engaging in greenwashing practices?
C8: Longitudinal studies and comparative analysis	<ol style="list-style-type: none"> 1. What is the long-term effectiveness of different retention strategies in reducing turnover rates across industries? 2. How does TI evolve over time, and what factors influence this evolution in understanding TI? 3. How do sustainable business practices influence TI in different industries over an extended period? What are the varying effects in short-term versus long-term perspectives?

Based on the presented results and discussion, and the four research questions, it can be concluded that TI with respect to SBP is influenced by a variety of factors. These factors can be broadly categorized into three themes: job-related factors, organizational support and leadership, employee engagement, and ethical factors and were addressed in response to RQ1. The findings of RQ2 reveal that there are several variables that mediate the relationship between SBP and TI. Job satisfaction and organizational commitment are two such variables, while psychological safety and organizational commitment act as moderators, influencing how SBP affects TI. The results of RQ3 indicate that SBP have a positive impact on reducing TI, with key variables playing a mediating role. The current trends in this area of research are focused on environmental performance and the significance of intellectual capital. However, there are still gaps in the field, including limited industry representation, the need for longitudinal studies, exploring cultural factors, and utilizing diverse research approaches. The findings for RQ4 suggest that future research should investigate the factors that influence TI in specific industries, explore the connection between burnout and TI in sustainable careers, study mediating factors, and examine how CSR and SBP affect employees. It is crucial to understand the role of organizational culture and employee responsibility, as well as sustainability managers in greenwashing behavior. To provide more comprehensive insights into TI, longitudinal studies and cross-industry comparisons should be conducted.

CONCLUSIONS

Undertaking a comprehensive exploration of the association between sustainable business practices (SBP) and turnover intention (TI), the primary objective of this study was to understand the role of sustainability initiatives in influencing employee retention and organizational commitment. Utilizing the PRISMA Statement, a comprehensive Systematic Literature Review (SLR) was conducted spanning 2013 to 2023. Through a rigorous process of double-blind screening and filtering using the web-based tool Covidence for systematic review, a total of 31 relevant papers were identified from an initial pool of 326 papers in the Scopus database. The analysis addressed four research questions (RQs), revealing recurring patterns, emerging trends, and significant gaps in the literature, providing valuable insights into the SBP-TI relationship.

In response to RQ1, the findings consistently support the positive impact of SBP on various employee outcomes, including reduced TI, increased job satisfaction, and enhanced organizational commitment (Adeyefa et al., 2021; Ayodele et al., 2022; Barthauer et al., 2020; Guerci et al., 2019; Lu et al., 2023; Nejati et al., 2021; Sobaih et al., 2022; Stadler et al., 2022; Valyte-Zeimiene & Buksnyte-Marmiene, 2022; Wen et al., 2022). The literature reveals three significant thematic groups: job-related factors, organizational support and leadership, and employee engagement and ethical factors. These findings underscore the consistent benefits of adopting SBP and highlight the influence of factors such as pay, employment relationship, employee welfare, career growth, workplace ethics, departmental support, and transformational leadership on TI. Implementing SBP in organizations is crucial for fostering positive employee outcomes and reducing TI.

The results from RQ2 provide valuable insights into the complex dynamics between SBP and TI, with a focus on the mediating effects of job satisfaction (Nejati et al., 2021), the significance of work (Guerci et al., 2019), and organizational commitment (Gomes et al., 2023; Jarkovská & Jarkovská, 2022; Mahfouz et al., 2022). Furthermore, the study identified several important moderating variables that impact the SBP-TI relationship, including psychological safety (Sobaih et al., 2022), effective communication (Lloyd et al., 2015), ethical leadership (Ng & Salamzadeh, 2020), servant leadership (Mustamil & Najam, 2020), and SDG identity congruence (Westerman et al., 2022). Psychological safety and organizational commitment are especially highlighted as notable moderators affecting how SBP impacts TI. These variables influence the strength of the SBP-TI relationship and should be considered by organizations seeking to manage TI effectively. To this end, organizations should prioritize initiatives that enhance job satisfaction, foster organizational commitment, create a meaningful work environment,

promote open communication, and cultivate ethical leadership practices that align with sustainability goals. A comprehensive understanding of these variables will aid in the development of targeted strategies to promote SBP and mitigate TI.

Regarding RQ3, the consistent findings highlight the positive impact of SBP on reducing TI, increasing job satisfaction, and enhancing organizational commitment (Ayodele et al., 2022; Barthauer et al., 2020; Sobaih et al., 2022). Patterns, notably the positive influence of SBP and the mediating role of key variables, emerge. A growing focus on environmental performance and intellectual capital's role is also evident. Mediating variables such as employee engagement and organizational commitment play significant roles in translating the effects of SBP on TI (Guerci et al., 2019; Nejati et al., 2021). Thus, the implementation of sustainable practices is crucial for fostering positive employee outcomes.

In conclusion, regarding RQ4, our analysis has revealed certain gaps in the literature. It becomes imperative to investigate factors influencing TI in specific industries and the link between burnout and TI in sustainable careers. There is a clarion call to study how CSR and SBP practices affect employees. Specifically, there is a need for industry-specific studies to comprehend the variations in the impact of SBP on TI across various sectors (Ayodele et al., 2022). Longitudinal studies are also essential to establish causal relationships and evaluate the long-term effects of SBP on TI (Sobaih et al., 2022). Understanding the role of organizational culture, employee responsibility, and the influence of sustainability managers in greenwashing behavior emerges as critical. The examination of the impact of cultural and contextual factors on the SBP-TI relationship is crucial for enhancing the generalizability of findings (Nejati et al., 2021). By addressing these research gaps, future studies can provide a more comprehensive understanding of the relationship between SBP and TI, contributing to the advancement of knowledge in this field.

In summary, the presented SLR offers insights into SBP and TI. The review highlights the consistent positive influence of SBP on reducing TI and the role of mediating and moderating factors. Longitudinal studies and cross-industry comparisons are emphasized as pivotal to offer deeper insights into TI. The findings can guide organizations in developing strategies that accentuate sustainable business practices and mitigate TI. Future research is needed to address gaps and deepen our understanding of the SBP-TI relationship dynamics, including industry-specific studies, longitudinal research, and cross-cultural analyses.

Emerging from the identified literature gaps, the following research hypotheses were proposed:

H1: *The influence of sustainable practices on turnover intention will manifest differently across distinct industries and sectors.*

H2: *Organizations ingrained with robust sustainable business practices will observe a decrease in turnover intention rates over longitudinal timelines.*

H3: *National culture, societal norms, and legal frameworks directly moderate the sustainable business practices and turnover intention relationship.*

H4: *The sustainable business practices and turnover intention relationship varies across different cultural contexts.*

These hypotheses delineate potential avenues for future empirical research, emphasizing the intricate interplay between SBP, TI, and overarching cultural/contextual dynamics.

This study's methodology, while rigorous, has inherent limitations. Our exclusive reliance on Scopus, though comprehensive, may have overlooked specialized or region-specific articles. Additionally, by focusing on English-language publications, we might have missed relevant research in other languages. Recognizing these constraints bolsters the study's integrity, and future endeavors should contemplate diversifying data sources and expanding the linguistic spectrum.

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Appendix A1

Table A1. Type of industries and geographic spreading of studies

Type of industries	Geographic spreading of the studies
Tourism and Hospitality	Saudi Arabia
Construction	New Zealand
Government institution	South Africa
Academic scientist	Germany
Education and Engineering consultancy	Australia
Hotels	Australia
Hotels	Nigeria
Different organizations	Portugal
European Association for People Management	29 European countries
High-tech companies	Taiwan
Airports	Oman
Hospitality	Czech Republic

Type of industries	Geographic spreading of the studies
Social networks	Different countries
Public servants	Taiwan
Sports	Germany
Electronic	China
Construction projects	Malaysia
Governmental institutions	Qatar
Public healthcare	United Arab Emirates
Higher education institutions	Pakistan
Telecommunication, medical, industrial, and electronics	Malaysia
Public administration	Vietnam
Manufacturing, engineering, banking and finance, sales and marketing, transportation and logistics, education	Malaysia
Apparel industry	Sri Lanka
ICT	Malaysia
Hotel	Saudi Arabia
Events Industry	UK
Socially responsible organisations	Lithuania
Pharmaceutical manufacturing	China
Sustainability managers	Different countries
Government-Linked Companies	Malaysia

When examining the similarities and differences in the perspectives of sustainable business practices and turnover intention across various industries and geographical locations, several patterns and trends emerge from the 31 studies analyzed.

Similarities:

- 1) **Global Awareness:** Sustainable business practices and turnover intention are topics of global significance. Organizations across different industries and countries increasingly recognize the importance of sustainability and the challenges turnover poses.
- 2) **Research Spread:** Both topics have garnered attention across various industries, including construction, hospitality, government institutions, education, healthcare, manufacturing, technology, and more. This indicates a growing recognition of their relevance across sectors.
- 3) **Geographical Variation:** The issues of sustainable business practices and turnover intention are not confined to a specific region but are global

concerns. Research has been conducted in various countries, including Saudi Arabia, New Zealand, South Africa, Germany, Australia, Nigeria, Portugal, Taiwan, Oman, Czech Republic, China, Malaysia, Qatar, United Arab Emirates, Pakistan, United Kingdom, Lithuania, and Sri Lanka.

Differences:

- 1) **Industry-Specific Challenges:** Different industries face unique challenges in terms of both sustainable practices and turnover. For instance, the tourism and hospitality industry (Saudi Arabia, Nigeria, and Australia) may focus on minimizing environmental impacts and promoting responsible tourism. In contrast, the construction industry (New Zealand) might emphasize sustainable building materials and practices.
- 2) **Geographical Emphasis:** Research on sustainable business practices and turnover intention tends to be more concentrated in certain regions for specific industries. For example, the construction industry in New Zealand and the hospitality sector in Australia have garnered research attention. At the same time, some regions like Lithuania and the Czech Republic have explored socially responsible organizations in the context of sustainability.
- 3) **Cultural and Socioeconomic Influences:** Different cultural and socioeconomic factors can influence the implementation of sustainable practices and turnover rates. This could explain variations in research focus across countries and industries. For example, the events industry in the United Kingdom might address turnover influenced by cultural aspects, whereas social networks in Taiwan may consider turnover in the context of public servants.
- 4) **Organizational Types:** Research varies based on the organization under consideration. For instance, studies on sustainability managers, governmental institutions, and government-linked companies have been conducted in countries like Malaysia, Germany, and South Africa, each examining specific challenges and practices related to sustainability and turnover.
- 5) **European Context:** The European Association for People Management covers a wide geographical spread, encompassing 29 European countries. This organization's research likely highlights shared challenges and unique cultural considerations regarding sustainable practices and turnover intention.
- 6) **High-Tech and ICT Emphasis:** High-tech companies in Taiwan and the ICT industry in Malaysia might focus on turnover within the context of a rapidly evolving technological landscape, potentially exploring the retention of specialized talent.

In summary, while sustainable business practices and turnover intention share global relevance and have been studied across diverse industries and countries, the specific challenges, emphases, and contexts vary based on industry, geography, organizational type, and cultural influences.

Abstrakt

CEL: To badanie bada związek między zrównoważonymi praktykami biznesowymi (SBP) a zamiarem odejścia (TI), aby zrozumieć rolę inicjatyw zrównoważonego rozwoju we wpływie na zatrzymanie pracowników i zaangażowanie organizacyjne. **METODYKA:** W niniejszym badaniu przeprowadzono systematyczny przegląd literatury (SLR) zgodnie z podejściem Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA). Spośród wstępnej selekcji 326 artykułów, rygorystyczny proces selekcji metodą podwójnie ślepej próby pozwolił zidentyfikować 31 kluczowych artykułów do dogłębnej analizy. **WYNIKI:** Przegląd systematyczny dostarcza przekonujących dowodów na to, że SBP ma solidny pozytywny związek z wynikami pracowników, zwłaszcza w zmniejszaniu TI. Związek ten jest w szczególności pośredniczony przez satysfakcję z pracy i zaangażowanie organizacyjne oraz moderowany przez elementy bezpieczeństwa psychicznego i etycznego przywództwa. Ponadto dostrzeżono kluczowe luki, w tym konieczność zbadania zróżnicowanego wpływu SBP na różne branże, trwałe skutki SBP na TI, wpływ aspektów kulturowych i kontekstowych oraz pilną potrzebę postępów metodologicznych w badaniach międzykulturowych. W odpowiedzi na te luki sformułowano cztery hipotezy, aby uzyskać głębszy wgląd w złożoną zależność między SBP, TI i nadrzędnymi zmiennymi kulturowymi/kontekstowymi. **IMPLIKACJE:** Badania te uzupełniają istniejącą literaturę, empirycznie potwierdzając związek między SBP a TI, podkreślając krytycznych mediatorów i moderatorów oraz sugerując kierunki przyszłych badań. Uwzględnienie zidentyfikowanych luk i proponowanych hipotez zapewnia ustrukturyzowany kierunek dla kolejnych badań. Odkrycia podkreślają znaczenie integracji SBP ze strategiami organizacyjnymi w celu promowania zrównoważonego rozwoju przy jednoczesnym zwiększeniu dobrostanu i zatrzymania pracowników. Organizacje mogą dostosować się do celów zrównoważonego rozwoju i zwiększyć satysfakcję pracowników, koncentrując się na zaangażowaniu organizacyjnym, otwartej komunikacji i przywództwie opartym na etycznych i zrównoważonych zasadach. **ORYGINALNOŚĆ I WARTOŚĆ:** To badanie zapewnia kompleksowy przegląd wzajemnych zależności między SBP i TI, integrując spostrzeżenia z różnych badań. Zwracając uwagę na niedostatecznie zbadanych mediatorów i moderatorów, identyfikując luki badawcze i nakreślając pochodne hipotezy, badanie przygotowuje grunt pod przyszłe badania. Zawarte w nim praktyczne zalecenia są niezbędne dla organizacji, które równoważą cele zrównoważonego rozwoju ze stabilnością siły roboczej, z korzyścią dla wydajności organizacji i zadowolenia pracowników.

Słowa kluczowe: zrównoważone praktyki biznesowe, zamiar odejścia, TI, satysfakcja z pracy, zaangażowanie pracowników, zaangażowanie organizacyjne, upodmiotowienie pracowników, systematyczny przegląd literatury, PRISMA, przyszłe kierunki badań, hipotezy, luki badawcze, zielone ZZZ

Biographical notes

Anna Florek-Paszowska obtained her Ph.D. in Economics and in the field of Management Science from the University of Warsaw. Under the mentorship of Prof. Hc Dr. Thomas L. Saaty, who founded the Analytic Hierarchy Process/ Analytic Network Process, she has authored over 60 research publications that address intricate decision-making challenges in economics, management, and sustainable development. She received a postdoctoral research fellowship at Pontificia Universidad Católica del Perú for 2023 and a visiting scholarship at LASA, University of Pittsburgh. Her leadership roles as chairman and organizer of international conferences, coupled with her active judging participation in global hackathons, have further expanded the breadth of her academic contributions. She was also honored as the “Reviewer of the Year 2023” by the Current Research in Nutrition and Food Science Journal.

Carlos Arturo Hoyos-Vallejo is Doctor of Business Administration at Maastricht School of Management, The Netherlands, and Pontificia Universidad Católica del Perú. He is a professor of leadership, managerial and creative business skills, organizational behavior, and entrepreneurship with agile methodologies at CENTRUM-PUCP. His research topics are green consumption, sustainable business practices and turnover intention, organizational agility and empowerment of women in the workplace. Previously he worked for Universidad Externado de Colombia from 2015 to 2017. Carlos is a Lifetime Member of the International Honor Society Beta-Gamma-Sigma and Member of the Colombian Node of the Millennium Project. As a researcher, Dr. Hoyos-Vallejo has authored some scientific articles and actively collaborates as a reviewer for esteemed journals such as Cogent. Business & Management, and Cogent Social Sciences.

Authorship contribution statement

Anna Florek-Paszowska: Conceptualization, Methodology, Formal Analysis, Investigation, Resources, Data Curation, Writing – Original Draft, Writing – Review & Editing, Visualization, Project Administration. **Carlos A. Hoyos-Vallejo:** Conceptualizing, Formal Analysis, Investigation, Resources, Data Curation, Results, Writing – Review & Editing.

Conflicts of interest

The authors declare no conflict of interest.

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What are the real motivations and experiences of silver entrepreneurs? Empirical evidence from Poland

Daria Ilczuk¹ , Łukasz Dopierała² 
Joanna Bednarz³ 

Abstract

PURPOSE: Along with demographic changes, it is increasingly frequent that many mature people resign from their full-time jobs and decide to start their own businesses at a later age. Entrepreneurial activity among this group of so-called silver entrepreneurs can be caused by many motives, but these factors usually remain unknown to current employers or do not constitute a valid reason for understanding and keeping a mature person in the workplace. The purpose of this paper is to present new scientific results concerning entrepreneurial motivations, both internal and external, and the previous experiences of silver entrepreneurs from Eastern Europe based on an example from Poland. **METHODOLOGY:** We analyzed a unique sample of 1,003 owners of micro and small enterprises from Poland. The sample included only people over fifty. Our empirical study used a survey to explore the motivations and experiences of silver entrepreneurs that influenced their decision to start a business later in life. We linked attitude toward the behavior with motivation and utilized the “pull” and “push” factors. We utilized logistic regression to determine the factors related to starting a business above fifty. We also used the ordinary least square regression to determine the relationship between the explanatory variables and the age of starting a business by the respondents. **FINDINGS:** We found that the main “pull” factor positively influencing the start of business activity by silver entrepreneurs is the fulfillment of dreams as a broadly understood need for self-realization. However, the “push” factors (such as the occurrence of ageism in the

1 Daria Ilczuk, Ph.D. candidate, Doctoral School of Humanities and Social Sciences, University of Gdansk, Wita Stwosza 63, 80-308 Gdansk, Poland, e-mail: daria.ilczuk@phdstud.ug.edu.pl (ORCID: <https://orcid.org/0000-0001-9542-9720>), corresponding author.

2 Łukasz Dopierała, Ph.D., Assistant Professor at the Department of International Business, Faculty of Economics, University of Gdansk, Armii Krajowej 119/121, 81-824 Sopot, Poland, e-mail: lukasz.dopierala@ug.edu.pl (ORCID: <https://orcid.org/0000-0002-8515-7642>).

3 Joanna Bednarz, Associate Professor, Head of the Department of International Business, Faculty of Economics, University of Gdansk, Armii Krajowej 119/121, 81-824 Sopot, Poland, e-mail: joanna.bednarz@ug.edu.pl (ORCID: <https://orcid.org/0000-0003-4695-0258>).

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workplace, as well as the loss of employment and lack of other opportunities on the labor market) significantly reduced the probability of starting a company at the age of over fifty. On the basis of the positive impact of a “pull” factor, it can be concluded that entrepreneurial activity at a later age is the result of opportunity-based entrepreneurship. Due to the negative impact of the job-loss factor, people made redundant started their business activity at an earlier age, before the age of fifty. Regarding external entrepreneurial motivations, the support received from family is the most important factor related to the individual’s environment affecting starting a business by silver entrepreneurs. However, the support from friends and the support from government bodies were not significant factors influencing starting a business at a later age. **IMPLICATIONS:** Findings from our study have implications for both employers and groups who support entrepreneurship. First, from the point of view of employers, the occurrence of ageism in the previous workplace could have resulted in resignation from full-time employment at an earlier age and a faster start of business activity. It is surprising that negative behavior towards older employees may also be associated with resignation from work by younger people. From the point of view of government bodies and other stakeholder groups related to the development of entrepreneurship, it is interesting that the support received from government bodies in conducting business activities was statistically insignificant for each group of respondents. This suggests the need to identify effective support and to design a comprehensive strategy for the development of silver entrepreneurship. **ORIGINALITY AND VALUE:** The vast majority of previous studies used secondary data or focused mainly on Western Europe, in particular the United Kingdom, Finland, and France. Our contribution is to provide empirical evidence about the silver entrepreneurs from Eastern Europe, especially Poland. Our research included individuals who actually run their own businesses, opposite to previous studies that take into account people who are just considering starting a business. This is particularly important in relation to research on the entrepreneurial intentions of mature people to undertake entrepreneurial activities at a later age, and the real motivations of silver entrepreneurs.

Keywords: silver entrepreneurs, ageing, entrepreneurship, entrepreneurial motivations, push/pull factors

INTRODUCTION

The aging of society is one of Europe’s most important economic problems affecting the labor market. The issue of entrepreneurship among mature people expands the current discourse on reduced inequalities in relation to United Nation Sustainable Development Goal 10 in the age context (UN General Assembly, 2015). Mature people are a group at risk of exclusion from the labor market due to their age. Therefore examining the experience and motivation of silver entrepreneurs will contribute to strengthening the position of these people among society. In addition, supporting entrepreneurship is

one of the tasks of Sustainable Development Goal 8, which is promoting stable, sustainable, and inclusive economic growth, full and productive employment, and decent work for all people (UN General Assembly, 2015).

Regarding the characteristics of entrepreneurs at a later age, researchers often focus on defining this concept and the terminology used, as well as identifying appropriate target age groups. In the literature, several terms of entrepreneurship among mature people can be found, such as older entrepreneur (Kautonen et al., 2008; Kautonen, Down, et al., 2013; Kerr & Armstrong-Stassen, 2011; Kibler et al., 2011, 2012, 2014; Maâlaoui et al., 2013; Wainwright & Kibler, 2013), elder entrepreneur (De Bruin & Firkin, 2001), senior entrepreneur (Efrat, 2008; Kautonen, 2013; Pilkova et al., 2014, 2016; Soto-Simeone & Kautonen, 2021), silver entrepreneur (Ahmad et al., 2014), grey (or gray) entrepreneur (Harms et al., 2014; Stirzaker et al., 2019), second-career entrepreneur (Baucus & Human, 1994), third age entrepreneurs (Botham & Graves, 2009; Kautonen, 2008, 2013; Lewis & Walker, 2013). Several authors also use short terms resulting from the combination of adjectives describing aging with the word entrepreneur, like elderpreneur (Patel & Gray, 2006), and seniorpreneur (Maâlaoui et al., 2013).

For consistency and lack of confusion, we will use the term silver entrepreneurship throughout this article to refer to mature people who decided to start their own business at a later age, following Ahmad et al. (2014). We also use the phrases entrepreneurship among mature people, entrepreneur at a later age, and we avoid terms such as senior entrepreneur or older entrepreneur due to the neutrality in describing a group of people at a later age and avoiding associations with a lack of vitality among this group. The word mature is intended to evaluate positively because, unlike words such as old, and senior, it does not refer to age, but emphasizes status and experience.

Previous research conducted on mature people has focused mainly on preventing this group's exclusion from the labor market. However, along with demographic changes, it is increasingly frequent that many mature people resign from their full-time jobs and decide to start their own businesses, according to the Global Entrepreneurship Monitor (Schott et al., 2017). Manifestations of individual entrepreneurship among this group can be caused by many motives, but these factors usually remain unknown to current employers or do not constitute a valid reason for understanding and keeping a mature person in the workplace.

The relatively limited literature in the field of silver entrepreneurship still does not provide exhaustive information on this important aspect, which is the motivations and experiences of these people, influencing the propensity to start a business. In addition, the results of previous empirical studies are

often ambiguous. Moreover, the existing literature focuses mainly on Western Europe, in particular the United Kingdom (Soto-Simeone & Kautonen, 2021; Stirzaker & Galloway, 2017), Finland (Kautonen, 2008), France (Maâlaoui et al., 2013), and little concerns the countries of Eastern Europe, including Poland. The findings of Červený et al. (2016) show differences in the activity of silver entrepreneurship between Eastern and Western Europe and conclude that other research would be needed to understand how cultural and structural differences can influence the development of entrepreneurship among mature people. In addition, Kautonen et al. (2010) and Minola et al. (2016) emphasize that environmental issues at the regional and national levels can influence silver entrepreneurship. Therefore, future research will be particularly justified in Poland as a transition country, where mature people had to face the realities of an open market economy, significantly different from the centrally planned economy.

The main purpose of our article is to identify entrepreneurial motivations, both internal and external, which influenced the decision to start a business only at a later age. Our research also takes into account the previous experiences of mature people. In order to investigate the motivations and experiences of silver entrepreneurs that influenced their decision to start a business later in life, we used a combination of the push/pull approach (PPA) and the Theory of Planned Behaviour (TPB). To understand the reasons for the decision to start a business, the scientists used the PPA, dividing the factors influencing entrepreneurship activity into two categories (Kirkwood, 2009). In addition, the TPB has also found practical application in research focusing on entrepreneurial intentions and business creation, especially by mature people. Based on the theoretical background, we linked attitude toward the behavior (from the TPB) with motivation and utilized the “pull” and “push” factors from the PPA (Harms et al., 2014). We analyzed a unique sample of 1,003 owners of micro and small enterprises from Poland (only people over fifty were included). Based on the literature review, we observed that the vast majority of previous studies used secondary data (Biron & St-Jean, 2019). Therefore, our contribution is to provide empirical evidence about the entrepreneurial motivations and experiences of mature people from Eastern Europe, especially Poland. In addition, our research included individuals who actually run their own businesses, opposite to previous studies that take into account people who are just considering starting a business (Kautonen et al., 2010; Kautonen, van Gelderen, et al., 2013). This is particularly important in relation to research on the entrepreneurial intentions of mature people to undertake entrepreneurial activities at a later age, and the real motivations of silver entrepreneurs.

This paper is structured as follows. The second section presents the theoretical background, focusing on the concept of entrepreneurship among mature people, their internal entrepreneurial motivations, previous experiences, and external factors influencing entrepreneurial activities. The third section explains the process of data collection and analysis and the method used for the research. The fourth section discusses the results of the analyses. The last section presents a summary of the research and the debate on the conclusions from the research, as well as theoretical, practical, and managerial implications. It also identifies the study's limitations and suggests some directions for further research.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT ---

Concept of silver entrepreneurship

The key research topics and concepts related to silver entrepreneurship are mainly divided into three conceptual categories: the “who” category (which focuses on the characteristics of this group of entrepreneurs), the “why” category (examining the motivations which precede the intention to undertake entrepreneurial activities by mature people) and the “how” category (which analyzes the entrepreneurial process itself and the limitations faced by silver entrepreneurs) (Biron & St-Jean, 2019).

Kautonen has proposed definitions of silver entrepreneurship as individuals who become self-employed or start a new business late in their working career (Kautonen, 2008) and as individuals aged fifty or above who are planning to start a business, are currently in the process of starting one, or have recently started one (Kautonen, 2013). Blackburn et al. (2000) described silver entrepreneurship as mature entrepreneurs, especially those who have retired or opted for early retirement, to launch an entrepreneurship career.

The researchers mentioned that silver entrepreneurship is also identified as retirees (voluntary or involuntary) who started second-career businesses (Baucus & Human, 1994). At the same time, Bornard & de Chatillon (2016) stated that silver entrepreneurship refers to an individual who undertakes an entrepreneurial experience (creating or acquiring) as a second-career phase post the age of fifty. Other researchers, such as Maâlaoui et al. (2012), reported that silver entrepreneurship denotes individuals who have undertaken an entrepreneurial experience after the age of forty-five and wish to face social disengagement and extend their professional activities.

In previous studies, the authors more concisely described entrepreneurship among mature people, for example, an elderly person aged

fifty or over who owns and operates a business (Patel & Gray, 2006), older individuals over fifty (Efrat, 2008), entrepreneurship or self-employment, fifty and over (De Bruin & Firkin, 2001), entrepreneurs who become self-employed at a mature age (Harms et al., 2014), an individual aged 55–64 who has created a business for the first time (Rossi, 2009). There is also an approach based on the typological categorization of entrepreneurs around retirement age (Maâlaoui et al., 2013; Singh & DeNoble, 2003; Wainwright et al., 2015).

Silver entrepreneurship has several definitions. However, the idea behind this concept is the same, which means individuals nearing retirement who launched a new business after a career as a salaried worker (Bornard & Fonrouge, 2012). The general difference between the various definitions relates primarily to the age at which the individual starts a business. Based on the literature review, we noticed that most of the authors focus on the group of people over fifty, but a few researchers have extended the group to people aged thirty and older or forty and older (Ahmad et al., 2014; Say & Patrickson, 2012).

Internal entrepreneurial motivations and previous experiences

Previous research on the phenomenon of silver entrepreneurship is characterized by interdisciplinarity, using combinations of dimensions such as the social, economic, and psychological. The multidimensional research approach is based on economic theories and psychosocial theories. For example, Maâlaoui et al. (2013) used theories of disengagement, activity, continuity, and socialization to explain and understand entrepreneurial intentions among people who have retired or are close to retirement.

When it comes to deliberations on the entrepreneurial intentions of mature people, scientists most often refer to the Model of the Entrepreneurial Event (SEE) (Shapiro & Sokol, 1982) and the Theory of Planned Behaviour (TPB) (Ajzen, 1991). For example, Storzaker and Galloway (2017) used the SSE to investigate individuals over fifty from the United Kingdom who become entrepreneurs due to redundancy as the main reason to start a business. Elsewhere, Harms et al. (2014) applied the TPB to explore the drivers of motivations towards self-employment of silver entrepreneurs from the Rhine Valley with a particular focus on the organizational conditions at the previous employer.

In the literature, there are positive (“pull”) and negative (“push”) factors that refer to the opportunity or necessity to undertake entrepreneurial activities at a later age. “Pull” factors are related to self-realization, broadly understood as the need for achievement and the desire to fulfill a dream

(Kautonen et al., 2010; Kautonen, van Gelderen, et al., 2013; Singh & DeNoble, 2003), the need for independence and work autonomy (Harms et al., 2014; Kautonen, 2008; Stirzaker et al., 2019), looking for new challenges (Gimmon et al., 2019; Singh & DeNoble, 2003; Stirzaker & Galloway, 2017), comparing the benefits of keeping a job or starting a business (Singh & DeNoble, 2003), the desire to increase income in order to realize specific dreams (Maâlaoui et al., 2013; Weber & Schaper, 2004), the search for the work–life balance including reducing working hours or having a more flexible work schedule (Harms et al., 2014; Kautonen, 2008; Stirzaker et al., 2019; Weber & Schaper, 2004), and willingness to remain active in retirement and integrate with the environment (Kautonen, 2008; Stirzaker et al., 2019; Weber & Schaper, 2004). In the light of findings from previous studies, we formulate the following research hypotheses regarding “pull” factors:

H1: In Poland, the possibility of more flexible working hours compared to a full-time job has a positive impact on the probability of starting a business after the age of fifty.

H2: In Poland, the willingness to seek new challenges in life has a positive impact on the probability of starting a business after the age of fifty.

H3: In Poland, the fulfillment of dreams as self-realization has a positive impact on the probability of starting a business after the age of fifty.

H4: In Poland, the willingness to be active and integrate with other people has a positive impact on the probability of starting a business after the age of fifty.

“Push” factors are related to the lack of prospects on the labor market or for permanent employment (Harms et al., 2014; Kautonen, 2008; Stirzaker & Galloway, 2017), dissatisfaction with the previous job (Harms et al., 2014; Stirzaker et al., 2019), providing adequate financial resources for everyday life (Harms et al., 2014; Maâlaoui et al., 2012; Stirzaker & Galloway, 2017), dismissal from work (Harms et al., 2014; Stirzaker & Galloway, 2017; Walker & Webster, 2007), and the issue of gender inequality, age discrimination, and technological exclusion of mature people in the workplace (Curran & Blackburn, 2001; Weber & Schaper, 2004). Researchers also mention other factors that may motivate individuals at a later age to start a business, such as using knowledge and professional experience from a previous job or holding managerial positions (Kautonen et al., 2010). Consequently, we verify the following research hypotheses regarding “push” factors:

H5: In Poland, the dissatisfaction with previous full-time employment has a positive impact on the probability of starting a business after the age of fifty.

H6: In Poland, the occurrence of ageism in the workplace has a positive impact on the probability of starting a business after the age of fifty.

H7: In Poland, the loss of employment and lack of other opportunities on the labor market have a positive impact on the probability of starting a business after the age of fifty.

In their typological categorization of silver entrepreneurs, Singh and DeNoble (2003) mentioned personal achievement and the fulfillment of dreams as factors motivating the silver entrepreneur who has entrepreneurial tendencies but never used them for various reasons. Stirzaker et al. (2019) found that the most frequently reported motivations of silver entrepreneurs in the United Kingdom to start a business were related to independence and autonomy in the form of a desire to be their own boss. However, Stirzaker and Galloway (2017) also confirmed that new challenges are not a significant factor for a mature person who has been made redundant from a previous job and started their own business or self-employment. Elsewhere, Harms et al. (2014) indicated that flexibility related to maintaining a work–life balance is important not only for women silver entrepreneurs. At the same time, Weber and Schaper (2004) emphasized that aging and staying active also depend on the role of society and supporting the entrepreneurial activities of mature people. On the other hand, Curran and Blackburn (2001) indicated ageism and a lower ability to use new technologies as the main reasons for the resignation of mature people from full-time work and going into self-employment. The findings of Walker and Webster (2007) show that the redundancy and lack of alternative employment were the greatest reason for silver entrepreneurs to start their businesses.

“Pull” and “push” factors derive from the basic theories of entrepreneurial motivation (Amit & Muller, 1995). To understand the reasons for the decision to start a business, the scientists used the push/pull approach (PPA), dividing the factors influencing entrepreneurship activity into two categories (Kirkwood, 2009). In addition, the TPB has also found practical application in research focusing on entrepreneurial intentions and business creation. According to the TPB, intentions are defined as indications of how hard persons are willing to try and how much effort they are planning to exert in order to perform the behavior (Ajzen, 1991). In addition, Ajzen (1991) stated that intentions and, ultimately, behavior are connected with specific antecedents. TPB proposes the following independent determinants of intentions: attitude toward the behavior refers to the negative or positive evaluation of a given behavior by an individual, subjective norm refers to the

degree of social pressure to perform or not to perform that behavior, while perceived behavioral control (PBC) refers to the perceived ease or difficulty of performing the intended behavior.

Initially, Kautonen (2008) applied the PPA to investigate the motivations of silver entrepreneurs and TPB was also used in further studies (Kautonen et al., 2011). Harms et al. (2014) proposed a new approach to the research based on the elements of TPB, and linked attitude toward the behavior with motivation and used of the PPA. With references to the TPB, Brännback and Carsrud (2019) pointed out that PBC should not be equated with the concept of self-efficacy due to clear differences. The basic theories of entrepreneurial motivation also take into account risk appetite, which is not widely explored in the topic of silver entrepreneurship (Amit & Muller, 1995). Another important research issue in the area of silver entrepreneurship is the perception of age in the context of business activities (Tornikoski et al., 2012).

The results of previous empirical studies are often ambiguous. Moreover, they mainly concern highly developed countries. Thus, we contribute to the literature by verifying the research hypotheses regarding “pull” and “push” factors.

External factors influencing entrepreneurial activities

Apart from internal factors, the development of silver entrepreneurship is also influenced by many external factors related to the environment at various levels (macro, meso, micro) (Wach, 2015). Several studies indicate the importance of support from family and friends in decisions to start a business among mature people. Kautonen et al. (2011) investigated the relationship between the approach of family and friends in the context of subjective norms and the entrepreneurial intentions of mature people. Ahmad et al. (2014) explored the support from friends as an opportunity for silver entrepreneurs to be inspired by other successful people. Another factor that may affect the entrepreneurial behavior of this group may be some business background related to having an entrepreneur as a family member (Schröder et al., 2011). Brännback and Carsrud (2019) focused on the relationship between having a family business background and entrepreneurial intentions in the context of gender. An important issue indicated by Pilkova et al. (2014) is also the support of government bodies and other stakeholder groups related to the development of entrepreneurship. On this basis, we contribute to the literature by verifying the following research hypotheses regarding external factors influencing the entrepreneurial activities of mature people:

H8: In Poland, family support has a positive impact on the probability of starting a business after the age of fifty.

H9: In Poland, friends support has a positive impact on the probability of starting a business after the age of fifty.

H10: In Poland, state support has a positive impact on the probability of starting a business after the age of fifty.

Additionally, in order to understand the causes of the phenomenon better, the research should take into account cultural differences and the context related to the regional and national environment. Pilkova et al. (2014) investigated the relationship between the entrepreneurial propensity of mature people and the national entrepreneurial context in European countries, and their results showed different levels of business involvement depending on the country. Entrepreneurship among mature people is more obvious in highly developed countries where there is a high standard of living and an open market economy, like Northern Europe and Luxembourg, but is less apparent in the former Eastern Bloc countries. It should be emphasized that starting their own business by people at a later age is not always a manifestation of opportunity-based entrepreneurship, but is often also the result of an unfavorable situation on the labor market, which will result in a necessity-based entrepreneurship (Stirzaker & Galloway, 2017). In addition, it was observed that the conducted research focuses mainly on the area of Western Europe, in particular the United Kingdom, Finland and France, and little concerns the countries of Eastern Europe, including Poland. The findings of Červený et al. (2016) show differences in the activity of silver entrepreneurship between Eastern and Western Europe, and the conclusions highlight that other research would be needed to understand how cultural and structural differences can influence the development of entrepreneurship among mature people.

At the same time, Kautonen et al. (2010) and Minola et al. (2016) emphasize that environmental issues at the regional and national levels can have a profound influence on silver entrepreneurship. In addition, Kautonen et al. (2011) claim that national culture impacts entrepreneurial intentions, and Weber and Schaper (2004) add that it also affects age norms. Therefore, future research will be particularly justified in Poland as a transition country, where mature people had to face the realities of an open market economy, significantly different from the centrally planned economy.

METHODOLOGY

Sample and data collection

Our empirical study used a specially designed survey to explore the motivations and experiences of silver entrepreneurs that influenced their decision to start a business later in life. Based on a theoretical background, we used a combination of the PPA and the TPB, which assumes three sets of antecedents related to intentions and ultimate behavior: attitude toward the behavior, subjective norms, and perceived behavioral control. Following Harms et al. (2014), we linked attitude toward the behavior with motivation and utilized the “pull” and “push” factors from the PPA. Based on the literature review, the survey questionnaire was prepared and consisted of the following thematic blocks: basic information on running a business (including industry, start date), previous experiences (professional experience from job), assessment of positive and negative factors of entrepreneurial intentions (referring to attitude linked with the PPA), assessment of the individual’s environment (referring to subjective norms from the TPB). The survey also included questions relating to perceived behavioral control and self-efficacy (referring to the differences indicated by Brännback and Carsrud (2019), as well as an assessment of age perception, technological exclusion, and risk appetite. The last block contained questions about such socio-demographic factors as: gender, marital status, education, place of residence, and income. Before starting the research, a pilot study was conducted on 20 respondents (entrepreneurs over the age of fifty) to check the adequacy and comprehensibility of the questionnaire.

The main survey was conducted by the research company MRC Consulting from 05 January to 25 February 2022. The pattern of selecting entrepreneurs for the sample was as follows. Enterprises were selected randomly from the REGON register. The REGON register is a collection of information on economic entities in Poland kept by the Central Statistical Office. Only active REGON numbers assigned to natural persons conducting business activity were considered. The research company contacted the owner of the selected enterprise by telephone. If contact was possible, a survey was carried out. If communication was impossible, another entrepreneur was randomly selected. The Computer-Assisted Telephone Interviewing technique (CATI) was used in the data collection. The first question was to filter respondents and concerned the respondent’s age. Only people over fifty were included for further study. As a result of repeating the procedure, a sample of 1,003 respondents was collected. The final sample covered only owners of micro and small enterprises.

According to the Report on Small and Medium-Sized Enterprises in Poland (Skowrońska et al., 2022), micro and small enterprises account for 99.2% of all Polish enterprises, which is why we focused on this group.

Of the entrepreneurs surveyed, 95% were male. The age of the respondents ranged from 51 to 69 years. The average age of the respondent was 56 years. The research sample was dominated by married people (86%). Due to the level of education, the most numerous group were those with higher education (48%). Due to the industry, entrepreneurs dealing in wholesale and retail trade were the dominant group (31%). The share of respondents representing other groups of industries ranged from 2% to 10%. The average age of starting a business activity for the respondents in the research sample was 42 years. About 10% of the respondents (103 people) started running a business over the age of fifty and about 60% of the respondents (602 people) started running a business over the age of forty. The structure of the sample is presented in Table A1.

Variable measurement

The general characteristics of the variables used in the study are presented in Table 1. In relation to the main objective of the study, we calculated the age of starting a business by the respondents. For this purpose, we used information about the respondent's age and how long they have been running the business. On this basis, we classified respondents as silver entrepreneurs. Following the literature review, we concluded that most of the authors include people who started a business after the age of fifty into the group of silver entrepreneurs (Efrat, 2008; Kautonen, 2013; Patel & Gray, 2006). Therefore, our primary dependent variable is a binary variable that takes the value 1 if the respondent started a business after the age of fifty, and value 0 otherwise. It should be noted that in this case, people who started running a business before the age of fifty were treated as a control group. However, since some authors, such as Ahmad et al. (2014) and Maâlaoui et al. (2013), define the border of silver entrepreneurs even earlier, we decided to additionally define a dependent binary variable, assuming the value of 1 if the respondent started running a business after the age of forty, and value 0 otherwise. In this case, people who started running a business before the age of forty were treated as a control group. In order to check the robustness of the obtained results, we also decided to use as a dependent variable the age of starting a business activity by the respondent.

To verify the research hypotheses, we used three groups of independent variables measured on a five-point Likert scale. Each independent variable corresponded to one question of the survey questionnaire (Table 1). We

could not use several questions to measure individual factors, because a questionnaire prepared in this way would be too long, and we wanted to conduct the study on a large enough group of respondents.

The first group is related to the support received from the individual's environment in starting a business. We considered family, friends, and state support to start the business by respondents in the study. Following Kautonen et al. (2010), we treated support from family and friends as a measure of subjective norms, which means the individual's perceptions of these people's opinions on the decision to start or not to start a business. According to Pilkova et al. (2014), we also took into account the support received from government bodies in conducting business activities.

Table 1. Characteristics of the research variables

Variable	Definition/survey question	Responses categories	Source
Dependent variables			
Starting 40+	Starting a business by the respondent after the age of 40.	1 (if yes); 0 (otherwise)	(Ahmad et al., 2014; Maïlaoui et al., 2013)
Starting 50+	Starting a business by the respondent after the age of 50.	1 (if yes); 0 (otherwise)	(Efrat, 2008; Kautonen, 2013; Patel & Gray, 2006)
Starting age	Age of starting a business activity by the respondent.	An integer between 21 and 60	-
Independent variables			
Family support	My family encouraged me to start my own business.	Five-point Likert scale, ranging from "strongly disagree (1)" to "strongly agree (5)"	(Ajzen, 1991; Kautonen et al., 2010, 2011)
Friends support	My friends encouraged me to start my own business.		(Ahmad et al., 2014; Ajzen, 1991; Kautonen et al., 2010, 2011)
State support	I have received sufficient support from public institutions in running my own business.		(Pilkova et al., 2014)
Flexibility	Thanks to my own company, I wanted to set a more flexible schedule compared to full-time work.		(Harms et al., 2014; Kautonen, 2008; Stirzaker et al., 2019; Weber & Schaper, 2004)
Challenge	I am constantly looking for new challenges, which is why I decided to run my own company.		(Gimmon et al., 2019; Singh & DeNoble, 2003; Stirzaker & Galloway, 2017)
Dream	Starting my own business was a dream come true.		(Kautonen et al., 2010; Kautonen, van Gelderen, et al., 2013; Singh & DeNoble, 2003)
Staying active	I wanted to be active and integrate with other people, and running my own business enables me to do so.		(Kautonen, 2008; Stirzaker et al., 2019; Weber & Schaper, 2004)
Job dissatisfaction	My previous job did not meet my expectations, so I decided to start my own business.		(Harms et al., 2014; Stirzaker et al., 2019)
Ageism	In my previous full-time job, I experienced unequal treatment of some employees due to their older age.		(Curran & Blackburn, 2001; Weber & Schaper, 2004)
Job loss	I lost my previous full-time job and I had no other opportunities to earn money, so I started my own company.		(Harms et al., 2014; Stirzaker & Galloway, 2017; Walker & Webster, 2007)
Control variables			
Family business background	Does a member of your family own and operate a business?	1 (if yes); 0 (if no)	(Brännback & Carsrud, 2019; Schröder et al., 2011)

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Variable	Definition/survey question	Responses categories	Source
Former manager	Have you ever been in a managerial position in a full-time job?	1 (if yes); 0 (if no)	(Kautonen et al., 2010; Weber & Schaper, 2004)
Uses experience	In running the company, I use my previous professional experience from full-time work.	Five-point Likert scale, ranging from “strongly disagree (1)” to “strongly agree (5)”	(Kautonen et al., 2010; Weber & Schaper, 2004)
Age perception	If I had to assess my age, I feel much younger than I really am.		(Curran & Blackburn, 2001; Tornikoski et al., 2012)
Internet use	I can use the Internet on my own and navigate its resources.		(Colovic et al., 2019; Curran & Blackburn, 2001)
Risk appetite	It is best to go in business where others are afraid, because there are more opportunities there.		(Amit & Muller, 1995; Weber & Schaper, 2004)
PBC	I knew the necessary practical details to start a firm.		(Ajzen, 1991; Harms et al., 2014; Kautonen et al., 2011; Liñán & Chen, 2009)
Self-efficacy	I am able to overcome many challenges related to running my own business		(Brännback & Carsrud, 2019; Chen et al., 2001)
Gender	Respondent’s gender	1 (if man); 0 (otherwise)	(Kautonen et al., 2010)
Marital status	Respondent’s marital status	Single Married Informal relationship Divorced Widow/widower	(Maâlaoui et al., 2013)
Education	Respondent’s education	Primary Vocational Secondary Higher	(Kautonen, 2008)
Residence	Respondent’s place of residence	Village Town below 50,000 residents City from 50,000 up to 100,000 residents City over 100,000 up to 250,000 residents City over 250,000 residents	(Lewis & Walker, 2013)
Industry	Respondent’s business industry	Manufacturing activities Construction and renovation services Wholesale and retail trade Transportation services Medical services Beauty and fitness services Hotel, restaurant and catering services Automotive services Financial and insurance services, real estate trade Professional, scientific and educational services Other services Other industry	(Harms et al., 2014)

The second group of independent variables concerns the positive factors influencing the undertaking of economic activity. We took into consideration the “pull” factors such as: the possibility of more flexible working hours compared to a full-time job (Harms et al., 2014; Kautonen, 2008; Stirzaker et al., 2019; Weber & Schaper, 2004), the willingness to seek new challenges in life (Gimmon et al., 2019; Singh & DeNoble, 2003; Stirzaker & Galloway, 2017), the fulfillment of dreams as self-realization (Kautonen et al., 2010; Kautonen, van Gelderen, et al., 2013; Singh & DeNoble, 2003), and the importance of

being active while aging and integrating with the environment (Kautonen, 2008; Storzaker et al., 2019; Weber & Schaper, 2004).

The third group of independent variables concerns negative (“push”) factors, among which the following were distinguished: the dissatisfaction with previous full-time employment (Harms et al., 2014; Storzaker et al., 2019), the occurrence of ageism in the workplace (Curran & Blackburn, 2001; Weber & Schaper, 2004), as well as the loss of employment and lack of other opportunities on the labor market (Harms et al., 2014; Storzaker & Galloway, 2017; Walker & Webster, 2007).

Based on the literature, we added a set of control variables to our study. There is empirical evidence that a family business background has a significant impact on starting a business (Brännback & Carsrud, 2019; Schröder et al., 2011). For this reason, we decided to control this factor by introducing a binary variable with a value of 1 when a family member of the respondent operates their own business.

The research conducted so far also indicates that the competences and experience resulting from previous full-time employment may have an impact on starting a business at a later age (Kautonen et al., 2010; Weber & Schaper, 2004). In our study, we decided to control whether the respondents had previously held a managerial position in a full-time job and whether they used their previous professional experience in running the company. Research conducted by Curran and Blackburn (2001), and Tornikoski et al. (2012) also indicates that the perception of age may significantly influence people’s decisions about starting a business. For this reason, we included the appropriate control variable in the study. Technological exclusion and the ability to use digital technologies may also be important when starting a business (Colovic et al., 2019; Curran & Blackburn, 2001). For this reason, we included a proxy control variable based on self-assessment of Internet literacy in the study.

Additionally, we included in the questionnaire questions controlling such personality traits of the respondents as their risk appetite (Amit & Muller, 1995; Weber & Schaper, 2004), perceived behavioral control (*PBC* variable) (Ajzen, 1991; Harms et al., 2014; Kautonen et al., 2011; Liñán & Chen, 2009), and self-efficacy (Brännback & Carsrud, 2019; Chen et al., 2001). Each feature was measured by one item in the survey questionnaire and it is represented in the model by the corresponding control variable. Detailed questions asked to the respondents and their sources are presented in Table 1.

In the study, we also controlled the socio-demographic characteristics of the respondents, such as gender (Kautonen et al., 2010), marital status (Maâlaoui et al., 2013), education level (Kautonen, 2008), and place of residence (Lewis & Walker, 2013). Moreover, we controlled the industry in which the respondents conduct their business (Harms et al., 2014). For

further analysis and modeling, categorical variables were transformed into quantitative variables by assigning the appropriate dummy binary variable to each category. Descriptive statistics of the variables are presented in Table A2 and correlations between quantitative variables are presented in Table A3.

Modeling strategy

We used two analytical tools in the study: logistic regression and ordinary least squares (OLS) regression.

Firstly, we utilized logistic regression to determine the factors related to starting a business above the assumed age. Logistic regression is widely used in both current research on entrepreneurship (Al Mamari et al., 2022; Croitoru, 2020; Rodríguez-López & Souto, 2019) and research related directly to the effects of aging on entrepreneurial behavior (Le Loarne-Lemaire & Nguyen, 2019; von Bonsdorff et al., 2019). It allows for assessing the relationship between the explanatory variables and the probability of a certain event. In our study, the probability of starting a business after the age of fifty (*Starting 50+* variable) and after forty (*Starting 40+* variable) is considered. The logistic regression model we used is defined as:

$$P(Y = 1|X_1 = x_1, X_2 = x_2, \dots, X_n = x_n) = \frac{\exp(\beta_0 + \sum_{k=1}^n \beta_k X_k)}{1 + \exp(\beta_0 + \sum_{k=1}^n \beta_k X_k)}, \quad (1)$$

where:

$P(Y = 1|X_1 = x_1, X_2 = x_2, \dots, X_n = x_n)$ represents the conditional probability of reaching the value of 1 by the dependent variable with specific values of the variables x_1, x_2, \dots, x_n ,

β_0 represents the constant term,

X_k is the k -th explanatory variable,

β_k represents the parameter for the k -th explanatory variable.

We estimated the model parameters with the maximum likelihood method using Stata 13 software. Originally, we estimated the model including all available variables. The results for the initial models are presented in Table A4. The likelihood ratio chi-square test indicates that the models obtained for both the variables *Starting 40+* and *Starting 50+* are statistically significant. This means that at least some of the explanatory variables have a significant impact on the probability of starting a business after forty and fifty. The Hosmer-Lemeshow test indicated that there is no problem of poor fit of the model to empirical data. However, a detailed analysis of the parameter values and standard errors suggested the elimination of some insignificant

variables. We applied a backwards stepwise regression procedure to improve the model specification. We set the significance level at 0.2 for removing variables from the model in all iterations because we wanted to keep every variable that might contribute some information. The results for the final models are presented in the next section.

We also used OLS regression to determine the relationship between the explanatory variables and the age of starting a business by the respondents. Robust standard errors were applied to the model because there was a problem of heteroscedasticity. The initial model included all the explanatory variables (Table A4). R^2 indicated that the model fit to the empirical data is not high. However, we do not recognize it as a weakness of the method, because we treat the models as explanatory rather than predictive tools. After the backwards stepwise regression procedure, the insignificant variables were eliminated. There was no problem with collinearity in the final model. The variance inflation factor (VIF) ranged from 1.01 to 3.49. The mean VIF was 1.5. The results for the final OLS regression model are presented in the following section.

RESULTS AND DISCUSSION

The estimation results of the final models are presented in Table 2. In the case of logistic regression, a statistically significant positive parameter value for a given explanatory variable indicates that it has a positive effect on the probability of the binary dependent variable taking the value 1.

Table 2. Final models

Variable	Responses categories	Dependent Variable					
		Starting 40+		Starting 50+		Starting age	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Robust Std. Err.
Family support		0.264***	0.073	0.247**	0.119	0.464**	0.224
Friends support		-0.234***	0.074			-0.402*	0.214
Flexibility						0.518**	0.263
Challenge		0.136**	0.066	0.164	0.104	0.340*	0.191
Dream				0.225**	0.109	0.315	0.195
Staying active		0.170**	0.071	-0.146	0.111	0.452**	0.209
Job dissatisfaction				0.193	0.122	0.297	0.205
Ageism		-0.216**	0.090	-0.460***	0.145	-0.746***	0.271
Job loss		-0.189**	0.080	-0.338***	0.116		
Family business background				0.780**	0.347		
Former manager		-0.481**	0.208	-1.490***	0.448	-1.298**	0.548
Uses experience		0.119*	0.063				
Age perception		-0.157**	0.065	-0.235**	0.101	-0.370*	0.202

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Variable	Responses categories	Dependent Variable					
		Starting 40+		Starting 50+		Starting age	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Robust Std. Err.
Internet use		0.320**	0.146				
Risk appetite				-0.206*	0.121		
PBC		0.180**	0.072			0.498**	0.224
Self-efficacy		0.190**	0.076			0.716***	0.235
Marital status	Single	Omitted		Omitted			
	Married	-0.480*	0.290	0.754	0.502		
	Informal relationship	-0.892**	0.427	1.421**	0.672		
	Divorced	Reference category		Reference category		Reference category	
	Widow/widower	0.501	0.747	Omitted		-	-
Education	Primary	Omitted				-0.428	0.792
	Vocational	0.552**	0.218			1.199**	0.587
	Secondary	0.118	0.160			-0.563	0.494
	Higher	Reference category		Reference category		Reference category	
Residence	Village	0.835	0.692	Omitted		0.800	2.154
	Town below 50,000 residents	0.846***	0.259	1.474***	0.384	3.307***	0.713
	City from 50,000 up to 100,000 residents	-0.333	0.216	0.357	0.376	0.213	0.678
	City over 100,000 up to 250,000 residents	-0.105	0.207	0.280	0.381	0.989	0.624
	City over 250,000 residents	Reference category		Reference category		Reference category	
Industry	Manufacturing activities	Reference category		Reference category		Reference category	
	Construction and renovation services	0.053	0.362	0.656	0.636	1.446	1.064
	Wholesale and retail trade	0.286	0.273	0.563	0.495	0.748	0.800
	Transportation services	0.236	0.332	0.309	0.578	0.298	0.882
	Medical services	1.087***	0.340	0.874	0.578	2.805***	0.919
	Beauty and fitness services	0.132	0.370	1.705***	0.579	1.199	1.219
	Hotel, restaurant and catering services	1.696***	0.373	0.812	0.625	3.741***	0.854
	Automotive services	0.787**	0.362	0.640	0.613	2.321**	0.951
	Financial and insurance services, real estate trade	-0.646	0.538	0.819	0.754	0.393	1.478
	Professional, scientific and educational services	-0.038	0.393	0.997	0.623	0.254	1.260
	Other services	-0.110	0.599	1.211	0.829	-2.269	2.548
	Other industry	0.578	0.498	0.239	0.903	0.222	1.609
	Constant		-2.049**	0.927	-3.022***	1.652	32.925***
Model fit							
Number of obs.		997		971		1003	
LR chi2 p-value		0.000		0.000			
Log likelihood		-599.53		-287.45			
Pseudo R2		0.108		0.121			
R2						0.114	
Hosmer-Lemeshow chi2 p-value		0.576		0.422			

Note: This table presents the logistic regression results for the *Starting 40+* and *Starting 50+* dependent variables, and the OLS regression of the *Starting age* dependent variable. Some categories of qualitative variables were omitted due to a small number of observations. Robust standard errors were used in the OLS estimation. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Based on the presented model, we verified the research hypotheses regarding push and pull factors as well as external factors (Table 3). The analysis of the variables representing the motivations to start a business indicates that the factor positively influencing starting a business after age fifty was the desire to fulfill the individual's dreams, which represents an internal factor related to self-realization (H3). These results are partly consistent with the study by Kautonen et al. (2010), who treat self-realization as an element of the entrepreneurial attitude. Ahmad et al. (2014) pointed out that the possibility of self-achievement was a more important pull factor of entrepreneurial activities for mature people than the desire to increase income. The *Flexibility* (H1), *Challenge* (H2), and *Staying active* (H4) variables were statistically insignificant in the case of people starting a business after the age of fifty. The *Flexibility* variables were also statistically insignificant for both the *Starting 40+* and the *Starting 50+* dependent variables. This contradicts the results of Harms et al. (2014), where flexibility and work-life balance in general were the main positive factors for starting a business at a later age. The logistic regression analysis for the *Starting 40+* dependent variable indicates that for people starting a business after the age of forty, looking for new challenges and staying active were significant factors. The above results are consistent with the conclusions of Stirzaker et al. (2019) that mature people prefer to invest their time in goals that are valuable to them compared to younger people who are looking for new challenges and integration with the environment.

The parameters of the push factors had the same signs for both the *Starting 40+* and the *Starting 50+* dependent variables. However, some push factors (the *Ageism* (H6) and *Job loss* (H7) variables) significantly reduced the probability of starting a business after the age of fifty. This means that people made redundant started their business activity earlier. This contradicts the findings of Stirzaker and Galloway (2017), indicating that another important negative factor after losing a job was the lack of alternatives, which was a result of necessity-based entrepreneurship. Harms et al. (2014) also mentioned that long-term unemployment is one of the main push factors of silver entrepreneurship. Redundancy may be related to starting a business at a younger age in the conditions of the economic crisis associated with the economic transformation in Poland and the lack of prospects on the labor market. Červený et al. (2016) investigated the entrepreneurial propensity of both the general population and mature people, comparing Western and Eastern Europe, and concluded that regardless of the group, Western European countries have a higher tendency to business initiatives, perhaps due to the historical background in the Eastern European countries. This is also in line with Kautonen (2008) and Pilkova et al. (2014), who have noted

the importance of the national context in research, especially in relation to silver entrepreneurship.

Moreover, the negative value of the parameter for the *Ageism* variable suggests that the occurrence of this phenomenon in the previous workplace could have resulted in resignation from full-time employment at an earlier age and a faster start of business activity by the respondents, which is partially consistent with the assumptions of Curran and Blackburn (2001) and Weber and Schaper, (2004). This is an interesting result from the point of view of employers, as it suggests that negative behavior towards older employees may also be associated with resignation from work by younger people. On the other hand, we did not observe the influence of the factor of dissatisfaction with the previous full-time job (H5) on starting a business after the age of fifty. This is in contrast to the results obtained by Harms et al. (2014), where job dissatisfaction was caused by the high ambitions of silver entrepreneurs. Storzaker et al. (2019) also listed this factor as significant, but job dissatisfaction was caused by the lack of freedom.

Variables representing external factors indicate that family support (H8) had a positive impact on the probability of starting a business after the age of fifty as well as after the age of forty. On the other hand, the support of friends (H9) had a negative impact on the probability of starting a business over the age of forty. This suggests that the support of friends can be an important motivator for people starting a business at a young age. Our results are in line with the research of Storzaker et al. (2019), which emphasized that with increasing age, mature individuals prefer to spend more time and strengthen bonds with family members, especially with a partner, compared to younger people who are looking for new relationships and friends. Moreover, Harms et al. (2014) found that family members who also run their own business support more the entrepreneurial activities of mature people and that the influence of the family does not discourage individuals from starting a business at a late age, but the opinion of the closest family members may have a significant impact on the choice of the company's industry. Kautonen et al. (2010) assume that the lack of support from the family has a negative impact on starting a business by mature people in the manual labor industry. The *State support* (H10) variable was statistically insignificant for each of the dependent variables, which is in line with the research of Pilkova et al. (2014).

Table 3. Verification of hypotheses

Hypotheses	Supported/ Unsupported
„Pull” factors	
H1: In Poland, the possibility of more flexible working hours compared to a full-time job has a positive impact on the probability of starting a business after the age of fifty.	Unsupported
H2: In Poland, the willingness to seek new challenges in life has a positive impact on the probability of starting a business after the age of fifty.	Unsupported
H3: In Poland, the fulfillment of dreams as self-realization has a positive impact on the probability of starting a business after the age of fifty.	Supported
H4: In Poland, the willingness to be active and integrate with other people has a positive impact on the probability of starting a business after the age of fifty.	Unsupported
„Push” factors	
H5: In Poland, the dissatisfaction with previous full-time employment has a positive impact on the probability of starting a business after the age of fifty.	Unsupported
H6: In Poland, the occurrence of ageism in the workplace has a positive impact on the probability of starting a business after the age of fifty.	Unsupported
H7: In Poland, the loss of employment and lack of other opportunities on the labor market have a positive impact on the probability of starting a business after the age of fifty.	Unsupported
External factors	
H8: In Poland, family support has a positive impact on the probability of starting a business after the age of fifty.	Supported
H9: In Poland, friends support has a positive impact on the probability of starting a business after the age of fifty.	Unsupported
H10: In Poland, state support has a positive impact on the probability of starting a business after the age of fifty.	Unsupported

Interesting insights can also be drawn from the control variables. The probability of starting a business after the age of fifty increased if the respondent had family members already running a business. The results of Harms et al. (2014) also indicated that being surrounded by family members who own companies better prepares a mature individual to start their business at a later age. This is also in line with the expectations of Brännback and Carsrud (2019), who assume that working in a family business has a positive impact on entrepreneurial intentions, especially in mature males. Having experience in a managerial position was associated with starting a business at an earlier age, which is inconsistent with the assumptions of Weber and Schaper (2004) that a greater level of management experience may provide silver entrepreneurs an advantage over younger entrepreneurs. In addition, the *Age perception* variable was negatively associated with the likelihood of starting a business

at a later age. However, this parameter should be interpreted with caution. It suggests that people who started their own business earlier feel younger than their age. Kautonen et al. (2015) pointed out that mature people who positively perceive their psychological age, which means that they feel younger, more often show entrepreneurial intentions.

We also observed a positive relationship between the *Internet use*, *PBC*, and *Self-efficacy* variables and the probability of starting a business over the age of forty. However, this relationship was no longer present in the model for the *Starting 50+* dependent variable. This suggests that people starting a business between the ages of forty and fifty had a lower sense of technological exclusion, as well as a higher sense of perceived behavioral control and self-efficacy. Our results are in line with research by Colovic et al. (2019), who found silver entrepreneurs to be less innovative than younger entrepreneurs, which may be due to cognitive decline with age and the ability to adopt new technologies. Curran and Blackburn (2001) also pointed out that mature people often have less ability to deal with new technology. However, since we used a proxy control variable, represented in the survey questionnaire by only one item, we believe that far-reaching conclusions should not be drawn in this case.

Taking into account the socio-demographic factors, it is worth pointing out that the probability of starting a business over the age of fifty and over the age of forty depended on the respondent's place of residence. In turn, education had an impact on the likelihood of starting a business over the age of forty. However, Kautonen (2008) indicated that educational background also has an important influence on people starting a business at the age of fifty and over. Moreover, our results suggest that the respondent's marital status significantly influences the probability of starting a business at an age above fifty, as pointed out also by Maâlaoui et al. (2013), adding other issues related to family status, such as financially dependent children at home.

The OLS regression results are generally consistent with the logistic regression results (Table 2, dependent variable: *Starting age*). The only difference appears in the impact of the *Flexibility* variable on the age of starting a business. The OLS regression indicates that the factors of working hours' flexibility were associated with starting a business at a later age. However, we treat this result as ambiguous, as the results of logistic regression do not confirm this relationship. The OLS regression confirmed that the search for new challenges was associated with starting a business later in life, but not necessarily after the age of fifty. A similar relationship was found for the *Staying active* variable. The OLS regression also validated that the occurrence of ageism in the previous workplace could influence starting a business at an earlier age. Moreover, the OLS regression indicated

that family support is associated with starting a business later in life, while friends support is associated with starting a business at an earlier age. The previously observed relationship that managerial experience is associated with starting a business at an earlier age was also confirmed. The analysis of control variables related to education level, place of residence, and industry also validated the relationships previously observed using logistic regression.

CONCLUSIONS

Silver entrepreneurship concerns professionally active people who still have some time left until retirement. They are usually characterized by considerable professional experience and they are looking for opportunities for the so-called late-career alternative. In addition, these people are also distinguished by the lifestyle that is specific to the roles and responsibilities at a mature age. In the article we concentrated on entrepreneurial motivations, external and internal, which influenced the decision to start their own business by mature people at a later age. We also took into account the previous experiences of silver entrepreneurs.

We found that the main “pull” factor positively influencing the start of business activity by silver entrepreneurs is the fulfillment of dreams as a broadly understood need for self-realization. Other “pull” factors included in our study, such as the possibility of more flexible working hours compared to a full-time job, the willingness to seek new challenges in life, and the importance of being active while aging and integrating with the environment, were not significant for people starting a business after the age of fifty. The “push” factor related to dissatisfaction with a previous full-time job was statistically insignificant for silver entrepreneurs. However, the “push” factors, such as the occurrence of ageism in the workplace, as well as the loss of employment and lack of other opportunities on the labor market, reduced the probability of starting a business at the age of over fifty.

On the basis of the positive impact of a “pull” factor, it can be concluded that in Poland the entrepreneurial activity of mature people at a later age is the result of opportunity-based entrepreneurship. Due to the negative impact of the job-loss factor, people made redundant started their business activity at an earlier age, before the age of fifty. This may be related to entering the business at a younger age in the conditions of the economic crisis associated with the transformation in Poland and the lack of prospects on the labor market.

When it comes to external entrepreneurial motivations, in our study the support from family was the main factor positively influencing the probability

of starting a business after the age of fifty. However, the support from friends and the support from government bodies were not significant factors for silver entrepreneurs in our study. In addition, the only factor related to the previous experiences of mature people that had a positive impact on the likelihood of starting a business after the age of fifty was a family business background. Moreover, our results suggest that the respondent's marital status significantly influences the probability of starting a business at an age above fifty. Based on our results, it can be concluded that the support received from family is the most important factors related to the individual's environment in starting a business by silver entrepreneurs in Poland. Mature people respect the opinion of their family on the decision to start or not to start a business at a later age.

Other previous experiences of mature people included in our study, such as the using of competences and professional experience from previous full-time employment, was not significant for people starting a business after the age of fifty, as well as holding a managerial position was associated with starting a business at a younger age. Moreover, the perception of age was negatively associated with the likelihood of starting a business at a later age. It suggests that people who started their own business earlier feel younger than their age. No significant relationship was observed between technological exclusion, perceived behavioral control, and self-efficacy in the group of mature people starting a business after fifty. However, other results suggest that people starting a business between the ages of forty and fifty had a lower sense of technological exclusion, as well as a higher sense of perceived behavioral control and self-efficacy.

Our research has implications for both theory and practice. In terms of theoretical implications, our findings suggest that the entrepreneurial motivations identified by previous authors for mature people who engage in business activity at a later age may vary depending on the countries or regions under investigation. This implies the need for further research on cross-cultural differences. Comparing results from different countries or regions can provide valuable insights into the influence of culture, social norms, and support systems on the decision to start running a business at a later age. Furthermore, our research highlights the need for further examination of the psychological aspects related to entrepreneurship activity among mature individuals.

Findings from our study have practical implications for both employers and groups who support entrepreneurship. First, from the point of view of employers, the occurrence of ageism in the previous workplace could have resulted in resignation from full-time employment at an earlier age and a faster start of business activity. It suggests that negative behavior towards

older employees may also be associated with resignation from work by younger people. From the government bodies and other stakeholder groups related to the development of entrepreneurship, it is surprising that the support received from government bodies in conducting business activities was statistically insignificant for each group of respondents. This suggests the need to identify effective support and to design a comprehensive strategy for the development of silver entrepreneurship in Poland, which is also important from the perspective of United Nation Sustainable Development Goals (UN General Assembly, 2015). Examples of support tools can include creating support networks for silver entrepreneurs. Organizing meetings, conferences, workshops, and mentoring programs can help build a community, facilitate the exchange of knowledge, and foster beneficial business relationships. An interesting approach could also involve supporting intergenerational entrepreneurship, where mature individuals collaborate with younger entrepreneurs. In addition, governments can implement administrative facilitations and training programs to promote entrepreneurial development among mature age groups. Searching for effective tools to support silver entrepreneurship could be also an interesting direction for further research.

There is a wide range of possibilities for other future research on the topic discussed in this paper. Therefore, we strongly encourage other researchers to follow and develop the research area, in particular the entrepreneurial motivations, both internal and external, of mature people to start doing business only at a later age, especially in other Eastern European countries. Another important issue for future research is the characteristics of business activities conducted by silver entrepreneurs, including the choice of industry, employment level, propensity to develop the company in the future, or the implementation of innovations. An interesting topic of research is also the impact of early retirement on starting a business at a later age in the case of privileged professional groups (in Poland, it concerns people working as, for example, soldiers, policemen, firemen, miners).

This study has some limitations. The main limitation is the proportion of women and men among the respondents. According to the Global Entrepreneurship Monitor Poland (Tarnawa et al., 2020), the group of silver entrepreneurs in Poland is dominated by men. We are aware that in our study the gender ratio is distorted and there is an overrepresentation of men. An additional limitation of the research is the specificity of entrepreneurs as a group of respondents. Entrepreneurs are characterized by a limited amount of time, which is related to a lack of willingness to take part in long surveys. Therefore, the questionnaire could not be too extensive and contain several questions on a given issue, which also imposed the selection of appropriate research methods used in the article. It should also be noted that the study

may cover mature people who declare themselves as entrepreneurs, but who, in fact, are full-time employees who are self-employed only to settle accounts with their current employer. Therefore, further research may consider these limitations.

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Appendix A

Table A1. Structure of the research sample

Definition/survey question	Responses range/category	Number of responses	Response percentage
Age of starting a business activity by the respondent	<20;25>	14	1.4
	(25;30>	31	3.0
	(30;35>	126	12.6
	(35;40>	230	22.9
	(40;45>	238	23.7
	(45;50>	261	26.0
	(50;55>	96	9.6
Respondent's gender	(55;60>	7	0.7
	Man	951	94.8
Respondent's marital status	Woman	52	5.2
	Single	5	0.5
	Married	859	85.6
	Informal relationship	47	4.7
	Divorced	79	7.9
Respondent's education	Widow/widower	13	1.3
	Primary	1	0.1
	Vocational	153	15.3
	Secondary	371	37.0
Respondent's place of residence	Higher	478	47.7
	Village	14	1.4
	Town below 50,000 residents	164	16.4
	City from 50,000 up to 100,000 residents	286	28.5
	City over 100,000 up to 250,000 residents	343	34.2
	City over 250,000 residents	196	19.5

Definition/survey question	Responses range/category	Number of responses	Response percentage
Respondent's business industry	Manufacturing activities	83	8.3
	Construction and renovation services	62	6.2
	Wholesale and retail trade	314	31.3
	Transportation services	98	9.8
	Medical services	100	9.9
	Beauty and fitness services	60	5.9
	Hotel, restaurant and catering services	88	8.8
	Automotive services	82	8.2
	Financial and insurance services, real estate trade	22	2.2
	Professional, scientific and educational services	49	4.9
	Other services	16	1.6
	Other industry	29	2.9

Table A2. Descriptive statistics

Variable	Responses categories	Mean	Std. Dev.	Min	Max
Starting 40+		0.600	0.490	0	1
Starting 50+		0.102	0.303	0	1
Starting age		42.309	6.854	21	60
Family support		3.147	1.009	1	5
Friends support		3.828	1.057	1	5
State support		2.565	0.881	1	5
Flexibility		3.470	0.901	1	5
Challenge		3.501	1.193	1	5
Dream		3.543	1.164	1	5
Staying active		3.254	1.018	1	5
Job dissatisfaction		3.216	0.995	1	5
Ageism		2.592	0.873	1	5
Job loss		2.119	1.114	1	5
Family business background		0.084	0.278	0	1
Former manager		0.155	0.362	0	1
Uses experience		2.693	1.391	1	5
Age perception		3.788	1.203	1	5
Internet use		4.391	0.518	2	5
Risk appetite		3.047	1.027	1	5
PBC		3.670	0.994	1	5
Self-efficacy		3.483	1.055	1	5

Variable	Responses categories	Mean	Std. Dev.	Min	Max
Gender: male		0.948	0.221	0	1
Marital status	Single	0.004	0.070	0	1
	Married	0.856	0.350	0	1
	Informal relationship	0.046	0.211	0	1
	Divorced	0.078	0.269	0	1
	Widow/widower	0.012	0.113	0	1
Education	Primary	0.000	0.031	0	1
	Vocational	0.152	0.359	0	1
	Secondary	0.369	0.483	0	1
	Higher	0.476	0.499	0	1
Residence	Village	0.013	0.117	0	1
	Town below 50,000 residents	0.163	0.370	0	1
	City from 50,000 up to 100,000 residents	0.285	0.451	0	1
	City over 100,000 up to 250,000 residents	0.341	0.474	0	1
	City over 250,000 residents	0.195	0.396	0	1
Industry	Manufacturing activities	0.082	0.275	0	1
	Construction and renovation services	0.061	0.240	0	1
	Wholesale and retail trade	0.313	0.463	0	1
	Transportation services	0.097	0.297	0	1
	Medical services	0.099	0.299	0	1
	Beauty and fitness services	0.059	0.237	0	1
	Hotel, restaurant and catering services	0.087	0.283	0	1
	Automotive services	0.081	0.274	0	1
	Financial and insurance services, real estate trade	0.021	0.146	0	1
	Professional, scientific and educational services	0.048	0.215	0	1
	Other services	0.015	0.125	0	1
Other industry	0.028	0.167	0	1	

Table A3. Correlation between quantitative variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
<i>Starting 40+</i> (1)	1.00																					
<i>Starting 50+</i> (2)	0.27	1.00																				
<i>Starting age</i> (3)	0.83	0.50	1.00																			
<i>Family support</i> (4)	0.13	0.05	0.08	1.00																		
<i>Friends support</i> (5)	-0.07	0.00	-0.01	-0.21	1.00																	
<i>State support</i> (6)	-0.01	0.01	0.01	0.03	0.21	1.00																
<i>Flexibility</i> (7)	0.03	0.03	0.12	0.06	0.12	0.09	1.00															
<i>Challenge</i> (8)	0.02	0.01	0.04	-0.03	0.08	0.11	0.06	1.00														
<i>Dream</i> (9)	0.04	0.03	0.04	0.10	-0.01	0.05	0.11	-0.05	1.00													
<i>Staying active</i> (10)	0.09	-0.02	0.10	0.02	0.05	0.04	0.13	0.05	0.10	1.00												
<i>Job dissatisfaction</i> (11)	-0.02	0.05	0.04	0.00	0.03	0.03	0.07	0.03	-0.05	0.03	1.00											
<i>Ageism</i> (12)	0.00	-0.04	-0.04	0.00	-0.02	0.15	-0.05	0.16	0.18	0.03	0.00	1.00										
<i>Job loss</i> (13)	-0.04	-0.03	0.01	0.07	0.01	-0.04	0.26	0.13	-0.10	-0.08	0.15	-0.21	1.00									
<i>Family business background</i> (14)	0.00	0.07	0.02	-0.05	-0.08	-0.06	-0.03	-0.03	-0.02	-0.02	0.03	-0.03	0.00	1.00								
<i>Former manager</i> (15)	0.00	-0.08	-0.03	0.16	-0.14	-0.06	-0.04	-0.06	0.00	-0.03	0.00	-0.15	0.00	-0.03	1.00							
<i>Uses experience</i> (16)	0.02	-0.01	0.01	0.19	-0.04	-0.09	0.29	-0.12	0.06	-0.03	0.13	-0.22	0.50	0.03	0.15	1.00						
<i>Age perception</i> (17)	-0.04	-0.04	0.02	-0.07	0.09	0.14	0.15	0.19	0.01	0.08	0.05	-0.10	-0.01	-0.02	-0.06	-0.11	1.00					
<i>Internet use</i> (18)	0.05	0.01	0.05	-0.03	0.15	0.03	0.13	0.16	0.10	0.04	0.08	0.07	0.00	0.00	-0.12	-0.08	0.06	1.00				
<i>Risk appetite</i> (19)	0.00	-0.06	0.03	-0.09	0.00	-0.10	0.00	-0.01	0.00	0.02	-0.02	0.09	0.04	0.00	-0.10	-0.03	0.02	0.07	1.00			
<i>PBC</i> (20)	0.10	0.00	0.10	0.05	0.00	0.07	0.06	0.00	0.07	0.04	0.00	0.07	0.04	0.06	-0.01	0.02	0.04	0.00	-0.01	1.00		
<i>Self-efficacy</i> (21)	0.07	0.02	0.14	-0.04	0.15	0.16	0.17	0.14	0.09	0.09	-0.06	-0.03	-0.10	-0.02	-0.07	-0.11	0.29	0.07	0.14	0.19	1.00	

Table A4. Initial models

Independent/ control variable	Responses categories	Dependent variable					
		Starting 40+		Starting 50+		Starting age	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Robust Std. Err.
Family support		0.263***	0.075	0.232*	0.124	0.524**	0.230
Friends support		-0.223***	0.076	-0.129	0.121	-0.413*	0.229
State support		-0.084	0.085	0.074	0.142	0.086	0.258
Flexibility		0.029	0.091	0.234	0.153	0.591**	0.290
Challenge		0.148**	0.068	0.147	0.107	0.384*	0.199
Dream		0.061	0.065	0.208*	0.113	0.300	0.200
Staying active		0.168**	0.072	-0.165	0.112	0.423*	0.215
Job dissatisfaction		-0.044	0.074	0.179	0.127	0.307	0.210
Ageism		-0.224**	0.094	-0.469***	0.155	-0.860***	0.278
Job loss		-0.190**	0.082	-0.327**	0.136	-0.217	0.248
Family business background		-0.128	0.268	0.878**	0.359	0.504	0.826
Former manager		-0.495**	0.209	-1.480***	0.458	-1.207**	0.563
Uses experience		0.110*	0.066	-0.093	0.112	-0.015	0.206
Age perception		-0.157**	0.066	-0.266**	0.105	-0.389*	0.207
Internet use		0.310**	0.150	-0.066	0.238	0.295	0.442
Risk appetite		-0.002	0.074	-0.215*	0.127	0.216	0.212
PBC		0.182**	0.073	-0.033	0.127	0.517**	0.229
Self-efficacy		0.190**	0.079	-0.024	0.121	0.643***	0.242
Gender		-0.323	0.334	-0.120	0.498	-0.842	1.044
Marital status	Single	Omitted		Omitted		1.843	1.150
	Married	-0.479	0.291	0.809	0.511	0.442	0.749
	Informal relationship	-0.873**	0.431	1.471**	0.681	0.436	1.236
	Divorced	Reference category		Reference category		Reference category	
	Widow/widower	0.401	0.746	Omitted		1.681	1.680
Education	Primary	Omitted		Omitted		-1.108	1.593
	Vocational	0.576**	0.222	-0.010	0.324	1.270**	0.591
	Secondary	0.127	0.161	-0.337	0.264	-0.513	0.509
	Higher	Reference category		Reference category		Reference category	
Residence	Village	0.895	0.700	Omitted		0.692	2.222
	Town below 50,000 residents	0.830***	0.262	1.539***	0.406	3.339***	0.721
	City from 50,000 up to 100,000 residents	-0.369*	0.221	0.359	0.386	0.124	0.695
	City over 100,000 up to 250,000 residents	-0.137	0.211	0.326	0.389	0.998	0.650
	City over 250,000 residents	Reference category		Reference category		Reference category	

Independent/ control variable	Responses categories	Dependent variable					
		Starting 40+		Starting 50+		Starting age	
		Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Robust Std. Err.
Industry	Manufacturing activities	Reference category		Reference category		Reference category	
	Construction and renovation services	0.084	0.368	0.739	0.652	1.399	1.096
	Wholesale and retail trade	0.263	0.278	0.620	0.501	0.691	0.823
	Transportation services	0.250	0.335	0.266	0.587	0.144	0.896
	Medical services	1.117***	0.347	0.823	0.591	2.724***	0.952
	Beauty and fitness services	0.101	0.376	1.743***	0.577	0.987	1.239
	Hotel, restaurant and catering services	1.735***	0.378	0.822	0.640	3.634***	0.885
	Automotive services	0.774**	0.369	0.657	0.620	2.222**	0.972
	Financial and insurance services, real estate trade	-0.604	0.540	0.869	0.771	0.483	1.518
	Professional, scientific and educational services	-0.032	0.397	0.911	0.632	0.303	1.276
	Other services	-0.136	0.604	1.368	0.856	-2.234	2.512
	Other industry	0.559	0.503	0.315	0.911	0.132	1.611
Constant		-1.658	1.004	-2.515	1.644	31.773***	3.056
Model fit							
Number of obs.		997		970		1003	
LR chi2 p-value		0.000		0.000			
Log likelihood		-597.76		-285.88			
Pseudo R ²		0.110		0.129			
R ²						0.119	
Hosmer-Lemeshow chi2 p-value		0.260		0.789			

Note: This table presents the logistic regression results for the Starting 40+ and Starting 50+ dependent variables, and the OLS regression of the Starting age dependent variable. All independent and control variables were included in the analysis. Some categories of qualitative variables were omitted due to a small number of observations. Robust standard errors were used in the OLS estimation. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Abstrakt

CEL: Wraz ze zmianami demograficznymi, można zaobserwować, że wiele dojrzałych osób rezygnuje z pracy na etacie i decyduje się na założenie własnego biznesu w późniejszym wieku. Przejawy indywidualnej przedsiębiorczości wśród tej grupy (tzw. srebrnych przedsiębiorców) mogą być spowodowane wieloma motywacjami, jednak czynniki te zazwyczaj pozostają nieznanne dla dotychczasowych pracodawców lub nie stanowią ważnego powodu do zrozumienia i zatrzymania osoby dojrzałej w miejscu pracy. Celem artykułu jest przedstawienie nowych wyników naukowych dotyczących motywacji przedsiębiorczych, zarówno wewnętrznych, jak i zewnętrznych oraz doświadczeń srebrnych przedsiębiorców z Europy Wschodniej na przykładzie Polski. **METODYKA:** W badaniu przeanalizowano unikalną próbę 1003 właścicieli mikro i małych przedsiębiorstw z Polski. W próbie uwzględniono tylko osoby powyżej

50. roku życia. Kwestionariusz ankiety został zastosowany do zbadania motywacji i doświadczeń srebrnych przedsiębiorców, które wpłynęły na ich decyzję o założeniu działalności gospodarczej w późniejszym wieku. W artykule powiązano postawy wobec danego zachowania z motywacjami i wykorzystano czynniki bazujące na szansie (ang. „pull”) i wynikające z konieczności (ang. „push”). Jako narzędzia analityczne zastosowano regresję logistyczną i regresję najmniejszych kwadratów. **WYNIKI:** Badania wykazały, że głównym czynnikiem „pull”, wpływającym na rozpoczęcie działalności gospodarczej przez srebrnych przedsiębiorców jest spełnianie marzeń jako szeroko rozumiana potrzeba samorealizacji. Jednak czynniki „push” (takie jak: występowanie dyskryminacji ze względu na wiek w środowisku pracy oraz utrata zatrudnienia i brak innych perspektyw na rynku pracy) istotnie zmniejszały prawdopodobieństwo założenia własnej działalności w wieku powyżej pięćdziesięciu lat. Na podstawie pozytywnego wpływu czynnika „pull” można stwierdzić, że w Polsce aktywność przedsiębiorcza osób dojrzałych w późniejszym wieku jest wynikiem przedsiębiorczości opartej na szansie. Jeśli chodzi o zewnętrzne motywacje przedsiębiorcze to wsparcie otrzymane od rodziny jest najważniejszym czynnikiem związanym z otoczeniem jednostki, wpływającym na rozpoczęcie działalności gospodarczej przez srebrnych przedsiębiorców. Jednak wsparcie ze strony przyjaciół i wsparcie ze strony organów rządowych nie były istotnymi czynnikami dla srebrnych przedsiębiorców w naszym badaniu. **IMPLIKACJE:** Wyniki naszego badania mają implikacje zarówno dla pracodawców, jak i grup wspierających przedsiębiorczość. Po pierwsze, z punktu widzenia pracodawców, pojawienie się dyskryminacji ze względu na wiek w poprzednim miejscu pracy mogło skutkować rezygnacją z pracy na etacie we wcześniejszym wieku i szybszym rozpoczęciem działalności gospodarczej. Sugeruje to, że negatywne zachowania wobec starszych pracowników mogą być również związane z rezygnacją z pracy przez osoby młodsze. Z punktu widzenia organów rządowych i innych grup interesariuszy związanych z rozwojem przedsiębiorczości interesujący jest fakt, że wsparcie otrzymywane od organów rządowych w prowadzeniu działalności gospodarczej było statystycznie nieistotne dla każdej grupy respondentów. Sugeruje to potrzebę identyfikacji skutecznego wsparcia i zaprojektowania kompleksowej strategii rozwoju srebrnej przedsiębiorczości. **ORYGINALNOŚĆ I WARTOŚĆ:** Zdecydowana większość wcześniejszych badań wykorzystywała dane wtórne lub koncentrowała się głównie na Europie Zachodniej, w szczególności Wielkiej Brytanii, Finlandii, Francji. Naszym wkładem jest dostarczenie wyników empirycznych na temat srebrnych przedsiębiorców z Europy Wschodniej, zwłaszcza z Polski. Nasze badanie obejmowało osoby, które faktycznie prowadzą własne przedsiębiorstwa, w przeciwieństwie do wcześniejszych badań, które uwzględniały osoby, które dopiero rozważają założenie działalności gospodarczej. Jest to szczególnie istotne w odniesieniu do badań intencji przedsiębiorczych osób dojrzałych do podejmowania działań przedsiębiorczych w późniejszym wieku oraz rzeczywistych motywacji srebrnych przedsiębiorców.

Słowa kluczowe: srebrni przedsiębiorcy, starzenie się społeczeństwa, przedsiębiorczość, motywacje przedsiębiorcze, czynniki push/pull

Biographical notes

Daria Ilczuk is a Ph.D. student at the Doctoral School of Humanities and Social Sciences at the University of Gdansk, Poland. Her research interests are focused on ageing, self-employment, SMEs, in particular the so-called silver entrepreneurship. Daria is a laureate of the UGrants research grant awarded by the University of Gdansk, Poland. She is also a member of the Polish Economic Society.

Łukasz Dopierała currently holds an Assistant Professor position at the Department of International Business, University of Gdansk. His research interests are focused on Pension Economics, Financial Markets and Sustainable Finance. He has published more than 30 articles and book chapters related to the above subjects. Łukasz has a PhD in Financial Economics from the University of Lodz. His Ph.D. thesis was awarded by the Financial Ombudsman in 2018. He is a member of the European Network for Research on Supplementary Pensions.

Joanna Bednarz is an Associate Professor at the Faculty of Economics, University of Gdansk. She is the head of the Department of International Business. Her research interests are in the areas of entrepreneurship, international business, consumption, and the behavior of young consumers. She is the author of 5 books, 30 book chapters and 40 scientific articles. She is involved in the activities of several scientific associations: Polish Economic Society in Gdansk (Head of the Scientific Council), University of Gdansk Publishing House (member of the council), IESE Business School Alumni Association University of Navarra.

Authorship contribution statement

Daria Ilczuk: Contribution, Methodology, Validation, Investigation, Resources, Data Curation, Writing – Original Draft, Writing – Review & Editing, Visualization, Project Administration, Funding Acquisition. **Łukasz Dopierała:** Contribution, Methodology, Validation, Formal Analysis, Data Curation, Writing – Original Draft, Writing – Review & Editing, Supervision. **Joanna Bednarz:** Contribution, Methodology, Writing – Review & Editing, Supervision.

Conflicts of interest

The authors declare no conflict of interest.

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Team members' direct participation in decision-making processes and the quality of decisions

Ryszard Rutka¹, Piotr Wróbel² 
Ewa Wycinka³ , Małgorzata Czerska 

Abstract

PURPOSE: Do teams manage to reach better decisions than those made by individuals? Numerous studies have delivered inconclusive results. Meanwhile, participation in decision-making can take various forms and is not limited to consensus group decisions, and the influence of the various forms of participation on the quality of decisions has been less frequently examined. The aim of the research was to determine the effect on decision quality of changing the form of direct participation in the decision-making process in the case of complex, multi-stage problems. **METHODOLOGY:** The article presents the results of a long-term experiment in which 598 teams of 2,673 people took part. The participants were asked to solve a decision problem using three decision-making styles: autocratic, consultative, and group. The participants played the role of members of a newly established project team that must plan its own work. The task concerned a problem that requires the analysis of a number of dependencies between sub-problems, in contrast to eureka-type problems. The decision problem was new to the participants, making it impossible to apply known solutions; a creative approach was therefore required. The decision was then compared with the optimal solution established by experts. Decision quality was based on the deviation of the proposed solution from the optimal solution. **FINDINGS:** The results of the experiment confirm the significant synergistic potential of increasing direct participation in decision-making for complex, multi-stage problems. A significant proportion of teams made better decisions as a result of increasing direct participation – replacing autocratic decisions with consultative and group decisions. The quality of consultative decisions was roughly in the middle of autocratic and group decisions. By using group

1 Ryszard Rutka, Professor emeritus, Faculty of Management, University of Gdańsk, Armii Krajowej 101, 81-824 Sopot, Poland, e-mail: ryszard.rutka@onet.pl.

2 Piotr Wróbel, Ph.D. Habilitated, Associate Professor, Faculty of Management, University of Gdańsk, Armii Krajowej 101, 81-824 Sopot, Poland, e-mail: piotr.wrobel@ug.edu.pl (ORCID: <https://orcid.org/0000-0002-4469-5874>), corresponding author.

3 Ewa Wycinka, Ph.D. Habilitated, Associate Professor, Faculty of Management, University of Gdańsk, Armii Krajowej 101, 81-824 Sopot, Poland, e-mail: ewa.wycinka@ug.edu.pl (ORCID: <https://orcid.org/0000-0002-5237-3488>).

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decision-making, teams made better decisions than the average individual decision and came closer to the decision quality achieved by the best team members. This effect was universal, observed both in the strongest and weakest teams. It should be remembered that, while group decision-making has the potential for synergy, it is not always achieved. Group decision-making markedly reduced the risk of making highly misguided decisions, and it can be reasoned that direct participation protects against serious mistakes more than it guarantees the best possible results.

IMPLICATIONS: *Team leaders should be familiar with different decision-making styles, their advantages and disadvantages, and the scope of their application. This research suggests that increasing team members' participation to a consultative role and even better, a full participatory role, increases the quality of the decision. With the growing complexity of organizations that have to deal with accelerating change, technology development and increased competition, creating structures that can flexibly respond to the challenges of the environment requires the participation of team members at all managerial levels. The use of consultative and group decision-making styles for complex and multi-stage problems supports this process. The group decision-making style can bring better quality, but it has its limitations and it is not always possible to use it. It requires a team of highly competent people who identify themselves with the interests of the organization. Otherwise, the consultative form will bring better results.*

ORIGINALITY AND VALUE: *For the first time, an empirical study analyses the case of consultative decision-making, in which the team leader consults the individual opinions independently to finally come up with a final "team" decision. This approach is widely used by team leaders and managers in the field. This study shows that this approach constitutes an improvement over the individual (autocratic) one but still falls short of the group decision-making approach. Finally, this study which has been done with the largest number of participant teams (598 teams, 2,673 individuals), professionally active post-graduate students and over a 24-year period allows a sound statistical confirmation of the proposed decision quality improvement when moving from individual to consultative and group decision-making styles.*

Keywords: *participation in decision-making (PDM), decision quality, consultative decision-making, group decision-making*

INTRODUCTION

Direct participation in decision-making (PDM) is a process of immediate personal involvement of an organization's members in decision-making (Cotton, 1988), and it is commonly believed among researchers that there are many advantages to and significant potential for PDM (Lorscheid & Meyer, 2021). Involving team members in decision-making is considered one of the most desirable options for improving the quality of management processes, especially in areas in which creativity and the uniqueness of products are a source of success. Rogelberg et al. (1992) noted that the search for solutions to organizational problems, the creation of new products,

and the development of marketing strategies are frequently delegated to temporary teams under the assumption that the solutions they develop will be better than an individual's work.

It is generally believed that groups have the potential to make better decisions on complex problems than individuals because they can combine diverse information, perspectives, and skills (DeVilliers et al., 2016). Collective decision-making bodies are often used to mitigate individual psychological biases or mitigate problems of self-interested behavior (Hafner-Burton et al., 2017).

Nevertheless, groups do not always outperform individuals. A number of studies are conducted on problems in the group decision-making process leading to incorrect decisions (Takemura, 2021). For example, group think theory explains group interaction patterns that may result in bad decisions (Esser, 1998). Biased information seeking, conformity pressures and the desire to preserve harmony, group homogeneity, or other social and contextual influences can suppress effective group decision-making (Schulz-Hardt et al., 2002; Bazerman & Moore, 2012).

Do teams manage to reach better decisions on complex problems than those made by individuals? Previous research is inconclusive; Cooper and Kagel (2005) suggested that small teams engaged in implementing strategic tasks deliver results above initial expectations, but other studies have found no significant improvements or even a deterioration in the quality of decisions by teams compared with individuals (Kerr et al., 1996a; Sutter et al., 2009). Studies of authoritarian and collective decision-making processes in the area of technological innovation bring ambiguous results (Saenz-Royo & Lozano-Royo, 2023).

Besides individual and group decisions, there are other decision-making styles. For example, many team leaders make a significant proportion of their important decisions after consulting team members. Sometimes consultations are conducted with selected members, other times with the entire team. Meanwhile, most of the PDM research has focused on comparing one-person decision-making with group decision-making (e.g., Casari et al., 2012; Hodder, 2001; Saenz-Royo & Lozano-Royo, 2023), but the question of the influence of different forms of participation on the quality of decisions has been less frequently examined.⁴ Although there are studies on consultative decision-making, they mostly concern determinants (Selart 2005; Hammoud 2011), procedures, and tools supporting managers (Chen & Tsai, 2015), rather than the effectiveness of this decision-making style.

⁴ It is worth noting that research on the effectiveness of team decision-making undertaken decades ago does not fully correspond with the changing competences of employees, the modern availability of information for decision-making, or the complexity of contemporary decision-making problems.

In conclusion, we see a research gap consisting in the lack of knowledge on how the effectiveness of autocratic, consultative and group decision-making differs in the case of complex problems. The aim of the current study was to determine the effect on decision quality of changing the form of direct participation in the decision-making process in the case of complex and multi-stage problems. Such a description of the problem is met if: 1) solving the problem requires knowledge from various areas of the company's operation, which is rarely possessed by one person, 2) work on the search for a solution is multi-stage, and the solution to the problem consists of a series of decisions that are related to each other – in contrast to eureka-type problems. These are problems that require original ideas and the abandonment of routine solutions based on experience or procedures. We took a similar approach to Hamada et al. (2020) and Hodder (2001) who investigated the use of different decision-making styles in real-life situations involving complex information integration. Our study examined three decision-making styles: autocratic, consultative, and group.

LITERATURE REVIEW

Zieleniewski (1976) described a decision as a non-random choice of action, but the output of the decision-making process is the decision itself, rather than the action, being a conscious selection of one of the options recognized as acceptable. Business decisions in a hierarchical context can be made both by a manager alone and with the participation of employees; in the latter case, the manager shares the right to make the decision, delegating to employees a part of the decision-making process.

Dachler and Wilpert (1978) emphasized that employee participation is not a homogeneous phenomenon, but rather takes several distinct forms, which can be distinguished along several dimensions: 1) mode of participation, ranging from direct to indirect; 2) level of access to information and employee influence on the decision made; 3) degree of formalization, ranging from formal to informal. Direct participation involves immediate personal involvement of the employees, while indirect participation involves a form of employee representation. Level of access to information and employee influence takes the form of a continuum beginning with employees not being informed in advance about the decision, ending with decisions made by the employees. The degree of formalization ranges from formal participation regulations within an organization to informal participation as part of the superior–subordinate relationship, regardless of regulations.

In our study we analyze different decision-making styles, both formal and informal. They include (Vroom & Yetton, 1973):

- autocratic – the leader makes the decision by himself and consults subordinates only to obtain information when necessary;
- consultative – the leader shares the problem with subordinates to get their opinion and then he/she makes the decision by him/herself; and
- group – the leader shares the problem with subordinates in a group meeting and attempts to reach group consensus on solutions.

Previous research on the effects of PDM has taken place both at the whole-organization level and with individuals directly involved in the decision-making process. The first type of study considered the effect of participation on the financial results of enterprises (Alsughayir, 2016; Spreitzer & Mishra, 1999) and on work productivity (Cummings & Malloy, 1977; Nwosu et al., 2020; Nazari et al., 2022), while the second examined the influence of participation on employee involvement (Benjamin, 1982; Rathnayake, 2017), motivation (Alzaanin & Sulaiman, 2020; Irawanto, 2015), satisfaction (Black & Gregersen, 1997), absenteeism (Hammer et al., 1981) and on the quality of the decision (Casari et al., 2012).

It is the last of these – the quality of the decision – that would seem very crucial and one of the key determinants of the choice of the decision-making style. Researchers use many different measures to evaluate the quality of decisions and the decision-making process (Schafer & Crichlow, 2010). A full assessment of the quality of a decision is possible only after its effects materialize, i.e., it can be significantly postponed in time. The balance of effects, positive and negative, can be the basis for such an assessment. The point of reference in the assessment may be the goals of the decision maker at the time of making the decision. Sometimes the assessment takes a financial dimension – calculation of the net present value of the effects of the decision (Schilling, 2007). The assessment carried out immediately after the decision is made, when its full effects are not yet known, is of a different nature. The evaluator may use a forecast of the effects of the decision and the degree of achievement of the decision maker's goals. A different approach involves comparing the decision made with a best decision indicated by a panel of experts (Schilling, 2007). In this case, the quality of individual or group judgment is defined as the absolute value of the discrepancy between the judgment and the true value determined by experts (Einhorn et al., 1977). This approach was adopted in our research, as in other studies comparing decision-making methods (e.g., Hamada et al., 2020; Hodder, 2001).

Researchers point to a number of phenomena that may occur during the participation process and may affect the quality of decisions (Kerr et al., 1996b; Rutka, 2007; Tindale et al., 2003; Töre & Uysal, 2022; Tyler & Smith, 1998). Potential positive factors include:

- the option of analyzing the problem from multiple perspectives based on the competences of the team members;
- interactions within the team creating synergy; and
- overcoming over-specialized or subjective perceptions of the problem.

On the other hand, factors that can adversely affect decision quality include:

- the risk of the decision-making process being dominated by team members with an intellectual or formal advantage over others;
- the risk of more extreme decisions, either riskier or more cautious than individual decisions; and
- the risk of pressure to maintain group cohesion overcoming important objections and creating false support.

Much research has been done on the dynamics of group processes and the factors affecting decision quality (Hall & Watson, 1970). A separate stream of research is devoted to tools supporting the decision-making process, e.g., decision models (Feng et al., 2022), decision trees (Diao & Zhang, 2021), and IT tools (Hema & Kumar, 2022).

The effect of direct participation on the quality of decisions is most commonly examined experimentally. For example, in Casari et al. (2012), participants made a series of decisions about the price to be proposed for acquiring an enterprise. Sutter et al. (2009) compared the results achieved by individuals and by teams during an auction. Some researchers have used experimental designs in which teams had to make decisions in (fictional) life-threatening survival scenarios. The experimental situations were similar to those used in the training of management staff, being set in a desert (Lafferty & Pond, 1974), in an area affected by an earthquake (Hodder, 2001), or the most popular, on the surface of the moon – the “NASA moon survival task” (Hall & Watson, 1970). In such tasks, the participants typically must rank a dozen or so items according to their importance for the team’s survival in a hypothetical situation. The task is thus new to the participants, complex, and requires detailed analysis and evaluation. Many tasks that team leaders must deal with, especially at higher levels, are of a similar nature. The quality of collective decisions in these studies has been found to be better than individual decisions, on average (e.g., Hodder, 2001; Miner Jr., 1984). For

example, in Hamada et al. (2020) study error scores for group decisions were significantly lower than individual decisions.

In most studies, researchers focus on comparing individual decisions with group decisions. Meanwhile, in practice, team leaders also make decisions after consulting their team members. The consultations may enable the expansion of the list of decision options and a more complete analysis of their possible effects. This decision-making style is much less researched. The published research concerns, for example, factors influencing the frequency of using a consultative decision-making style: psychological factors related to leaders (Selart, 2005), and national culture (Hammoud, 2011). Other research aims to refine this decision-making style. For example, Chen and Tsai (2015) propose an algorithm to support individual decision-making through a quantitative analysis of the recommendations of a large group of experts. However, there is no comparison of consultative style and its effectiveness in relation to individual and group decisions. As a result, a research gap can be identified: lack of knowledge on how the effectiveness of autocratic, consultative and group decision-making differs in the case of complex problems.

Three hypotheses were proposed to address the research gap. The first of them is based on results from experimental research (e.g., Hamada et al., 2020; Hodder, 2001; Miner Jr., 1984), but with the addition of a consultative style. Including the additional style in the hypotheses allows one to check whether the use of a consultative style means a significant difference, enabling a decision similar to a group decision, or will it rather be closer to an autocratic decision. When formulating the hypotheses, we adopted the perspective of team members and team leaders.

H1: A team leader who uses team members' direct participation for complex and multi-stage problems increases the probability of a higher quality decision than when making a decision autocratically.

The following two hypotheses concern the problem of synergy that can be achieved through participation in decision-making. Groups achieve synergy when their collective cognitive performance exceeds the performance of individual group members (Larson Jr., 2007). In previous studies of group decisions, synergy was measured by comparing the quality of the group decision against those made by individual members of a group. Researchers distinguish weak and strong cognitive synergy (Meslec & Curşeu, 2013). The first one arises when a group decision has a higher quality than the average quality of individual decisions of group members. The second synergy is observed when the group decision has a higher quality than the best individual results in a group.

In prior research, groups decisions in judgmental tasks have been of higher quality than the average of individual decisions – positive weak cognitive synergy was observed (Laughlin et al., 2003; Hamada et al., 2020; Hodder, 2001). However, taking the best individual decision in a team as the benchmark can change the result significantly. Previous research of strong cognitive synergy is inconclusive. Some studies indicate the group was able to achieve a better score than the best individual decision (Crede & Sniezek, 2003) while others showed the opposite effect (Bonner et al., 2004).

The authors are not familiar with studies that analyzed the occurrence of synergy in the use of the consultative style. Therefore, we propose hypotheses that will allow the verification of the occurrence of both types of synergy in both group and consultative decision-making styles.

The following hypotheses address this issue:

H2: A team leader who uses team members' direct participation for complex and multi-stage problems increases the probability of a higher quality decision than the average of the individual members of a group.

H3: A team leader who uses team members' direct participation for complex and multi-stage problems increases the probability of a higher quality decision than the best individual decision from among the team members.

METHODOLOGY AND RESEARCH APPROACH

Experiments have been used in management science for a long time. Researchers used them analyzing inventory decisions (Chen, Kok & Tong, 2013), buyer and seller behaviors (Davis, Katok & Kwasnica, 2011), and demand forecasting behaviors (Kremer et al., 2011). Experiments have become an important method of studying the behavior of leaders, in particular the way they make decisions. For example, Coleman (2004) analyzed factors affecting managers' willingness to share power with subordinates, Ashill and Jobber (2014) explored the role of manager's experience on the decision-making process. Decision-making styles using the experimental method were also studied. An experimental design was chosen in order to allow the study of causal relationships and to provide a significant level of control over the study. The design of our research was inspired by previous experiments in which teams had to make decisions in life-threatening survival scenarios, e.g., the NASA moon survival task (Hall & Watson, 1970) and Earthquake – A Cooperative Learning Experience (Hodder, 2001). The experiment was prepared and conducted by Rutka and Czerska.

Experimental design

Definitions

- Team members' direct participation is the replacement of single-person decision-making by a team leader (autocratic) with decision-making by a team leader following consultation with team members (consultative decision) or with a decision made by the group as a whole (group decision).
- Independent variable is the decision-making style. In order of increasing level of participation, these were: 1) autocratic decision – the leader decides unilaterally and announces the decision without the participation of the group; 2) consultative decision – the leader consults individually with each team member and then decides; and 3) group decision – all participants reach a consensus.
- Dependent variable is decision quality.

Procedure

The participants of the experiment were faced with the task of organizing the work of the newly appointed project team. The task was to decide on the correct order for 20 listed tasks that comprised the implementation of a project. Exemplary tasks included: defining the required competencies from team members, defining checkpoints, carrying out coordinating activities, developing variants of project implementation, defining the necessary resources (a list of all tasks is described in Appendix 1). The scope of the required decisions covered many areas of the company's activities: finance, human resources, logistics, operations (complex problem). The solution to the problem was to make decisions that were interrelated, with certain components of a project determining the next components. For example, a prerequisite for starting the training of participants was defining the required competencies of team members, which in turn required prior determination of the project's objectives. The participants had to analyse a number of dependencies between sub-problems (multi-stage problem), in contrast to eureka-type problems. The decision problem was new to the participants, making it impossible to apply known solutions; a creative approach was therefore required. The design of the experiment was inspired by the NASA moon survival task, with some differences, including the topic of the task itself, the number of items to be ranked (20 instead of 15), and the introduction of an additional decision-making style – consultative decision-making.

The chosen solution was then compared with the optimal solution. Such a single correct solution was established by a panel of experts – academics

specializing in project management. For each of the 20 tasks, the absolute deviation between the assigned position and the experts' position was calculated, and the values of all deviations were then totaled. The resulting total – the error score – represented the overall scale of the deviation from the optimal solution; the lower the score, the higher the decision quality, which was the dependent variable in the experiment (an example of such a calculation can be found in Appendix 1). The experiment was carried out in the following stages:

- Introduction: The researchers presented the protocol of the experiment to the participants.
- Stage 1: Individual decision-making. Each of the participants independently analyzed the task and determined the order of implementation. This stage can be equated with autocratic decision-making.
- Stage 2: Consultative decision-making. The participants were randomly assigned to teams of 4–5 people, and team leaders were chosen by the team members. The leaders then discussed the problem individually with each team member, and after listening to everyone's opinions, made the choice on their own.
- Stage 3: Group decision-making. The team leader acted as a discussion moderator, otherwise participating with the same rights as other team members. The leader could not impose an opinion and was obliged to accept the solution approved by the group. The group was expected to make decisions by consensus on each issue (unanimous accord), and vetoes were not permitted, as was described in Hall and Watson (1970).

The order in which the various decision-making styles were used was the same for each team participating in the experiment. In this way, the risk that the results of team discussions (group decision-making) would influence individual results (autocratic decision-making) was eliminated. A similar approach was used by Hodder (2001) and Meslec et al. (2014).

After Stage 3, the participants learned the experts' solution to the task and then calculated the deviations between their allocated positions and those of the experts.

Throughout the experiment, the researchers observed the teams, reminding participants of the rules as needed to ensure the protocol was followed. At the end of each experiment, the authors collected the obtained results – paper forms containing the error scores of each team.

Conditions

- 1) To avoid one team member dominating the decision-making process, the teams should be composed of people with similar levels of knowledge regarding the decision problem. Participants with experience in project management would be able to achieve better results than others. Before starting the experiment, the researchers asked participants about such experiences, and such people were excluded from the experiment.
- 2) Team leaders are chosen by their members but should not be formal superiors of the team members or persons with titles, diplomas, or certificates that could be a source of advantage in the discussion on the solution to the problem.
- 3) There should be no signs of antipathy or especially hostility among the team members. This condition applies particularly to the relationships between the team leader and its members.
- 4) All team members should be interested in achieving the best possible result regardless of whether it is credited to individual members of the group, the leader, or the entire team.
- 5) The solution proposed by the participants of the experiment should be expressible using measurable values that can be compared with an optimal solution established by experts. Decision quality is then based on the deviation of the proposed solution from the optimal solution (expressed in absolute numbers).

Sample

The sample consisted of postgraduate students who were active professionals as experiment participants (Table 1). Data were collected in Poland between 1994 and 2017, and the same experimental design was used throughout this period. The experiment was not continued after 2017. Such a long period of the experiment resulted from two goals: 1) conducting the study on a quantitatively significant research sample, 2) determining whether the result of the experiment changes with the passage of time and changing conditions. Due to the limited volume of the article, the authors did not analyze in detail the development of the results of the experiment over 24 years (second goal mentioned above). However, such a long study period made it possible to collect a very large sample – 2,673 people took part, comprising 598 teams of 4–5 people each. Participants took part only once and received no remuneration for their participation.

Table 1. Participants by year

Year	Numbers of teams				Total	Number of participants
	Master of Business Administration (MBA)	Postgraduate management studies (PSM)	Postgraduate HR studies	Healthcare Management postgraduate studies (ZPL)		
1994	0	6	0	0	6	30
1995	0	16	0	0	16	80
1996	0	11	0	0	11	55
1997	6	28	0	6	40	200
1998	6	20	0	7	33	165
1999	4	12	0	7	23	115
2000	5	15	0	9	29	145
2001	6	15	4	10	35	175
2002	5	15	5	4	29	145
2003	5	7	9	6	27	135
2004	3	0	0	6	9	45
2005	3	6	7	7	23	115
2006	4	9	17	7	37	148
2007	0	9	13	9	31	124
2008	0	16	15	9	42	168
2009	0	14	17	14	45	180
2010	0	16	10	8	34	136
2011	0	8	0	12	20	80
2012	0	7	0	13	20	80
2013	0	0	0	5	5	20
2014	0	15	0	8	23	92
2015	0	17	0	9	26	104
2016	0	9	0	7	16	64
2017	0	9	0	9	18	72
Total	47	280	97	174	598	2673

Limitations of the research method

- The absence of a control group makes it impossible to eliminate the possibility that factors other than the independent variable may have caused changes between the stages. It should be noted, however, that the stages took place immediately after one another, limiting this risk.

- The team leader was not chosen randomly. The selection was made by the group from among its members, and the researchers did not interfere in the process of selecting the leader. However, it should be emphasized that as each team member had the same possibility of being chosen as a team leader by their peers this may constitute a sort of randomness.
- The non-random selection of the participants may make it difficult to generalize the results to all professionally active people. A deliberate sampling method was used, with only postgraduate students currently in managerial positions or working people aspiring to managerial positions participating. All had higher education, they represented various fields of study, they did not have business or employment relationships that could affect the freedom and openness of the discussions, and there were no conflicts of interest between the members of the group. To ensure these conditions were met, the researchers abstained from conducting research inside enterprises and institutions.

Statistical methods

The primary data were the distributions of the error scores, each score being the sum of the deviations between the experimentally assigned ranks and the expert-assigned ranks. The assumption of normality of these distributions was tested using the Kolmogorov–Smirnov normality test and the Shapiro–Wilk test. The normality assumption was found to be violated, so the analysis of the differences between the distributions was performed using Friedman’s ANOVA (when comparing multiple distributions simultaneously) and the Wilcoxon signed-rank test for pairwise comparisons. The Kruskal–Wallis ANOVA and post-hoc tests were used to assess differences in pairs between the distributions. The significance of changes in the distributions of variables over time was tested using the linear trend function and the significance test of the trend function coefficient. Calculations and graphs were made using Dell Statistica 13.

According to the approach used by Hamada et al. (2020) and Meslec et al. (2014), we calculated synergy as follows:

- 1) Weak cognitive synergy:
 - Consultative: the difference between the average individual error score in the team (X_i) and the error score of the team leader (K_k) (consultative decision);
 - Group: the difference between the average individual error score in the team (X_i) and the error score of the team consensus (G)

- 2) Strong cognitive synergy:
- Consultative: the difference between the error score of the best team member (I min) and the error score of the team leader (Kk) (consultative decision);
 - Group: the difference between the error score of the best team member (I min) and the error score of the team consensus (G).

RESULTS

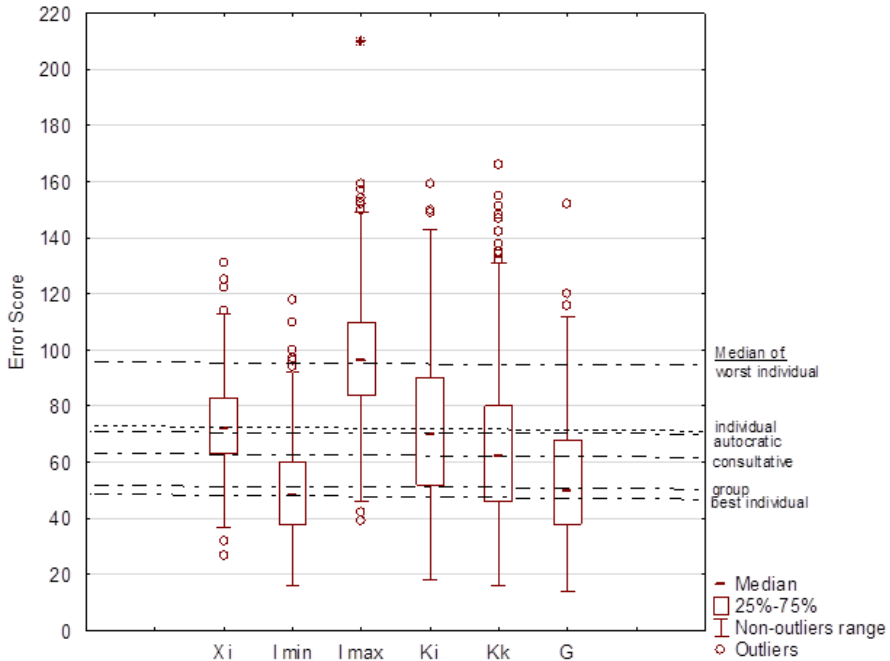
The participants calculated the sums of the deviations between their allocated values and the experts' values. The smaller this error score, the closer the decision of the participants was to that of the experts and thus the higher the decision quality. The following variables were then derived and used in the analyses (Table 2):

Table 2. Error score variable definitions

Variable	Description
Xi	The average score of the individual members in the team
I min	The best individual score in the team
I max	The worst individual score in the team
Ki	The individual score from Stage 1 of the participant who was chosen in Stage 2 to act as team leader (autocratic decision)
Kk	The team leader's score following consultation with the team in Stage 2 (consultative decision)
G	The score of the team consensus decision in Stage 3 (group decision)

The error score distributions are presented as boxplots in Figure 1. Differences were observed between the individual scores of the team members, the scores of the team leaders, and the group scores. As the level of PDM increased, the error score decreased, meaning an increase in decision quality.

The autocratic scores (Ki: Mean = 71.70, SD = 25.65) did not differ statistically significantly from the average individual scores (Xi: Mean = 72.72, SD = 15.62; Wilcoxon signed-rank test $p = 0.08$), meaning that the team leaders did not have a significant knowledge advantage over the team members at the beginning of the experiment regarding the subject of the task, and any increase in competence or improvement in the quality of decisions was therefore due to the exchange of views with team members.



Note: Xi = average individual result; I min = best individual result in each team; I max = worst individual result in each team; Ki = autocratic; Kk = consultative; G = group

Figure 1. Distributions of error scores

This is supported by the lower consultative error score in Stage 2 (Kk: Mean = 64.36, SD = 24.08; Wilcoxon signed-rank test $p < 0.00001$) and the even lower group score in Stage 3 (G: Mean = 54.41, SD = 21.60; Wilcoxon signed-rank test $p < 0.00001$). As PDM increased, the error score decreased, meaning increasing decision quality.

Changes in median error score of the individual decisions over time from 1994 to 2017 were analyzed (Figure 2). The median error score in the period from 1994 to 2003 did not increase significantly (coefficient of the linear trend function $b = -0.34$, $p = 0.1108$) and only once exceeded 70 points, while in the period from 2003 to 2017, it increased significantly by an average of 0.59 points per year (coefficient of the linear trend function $b = 0.5875$, $p = 0.0412$) and only once fell below 70 points, exceeding 80 points on three occasions.

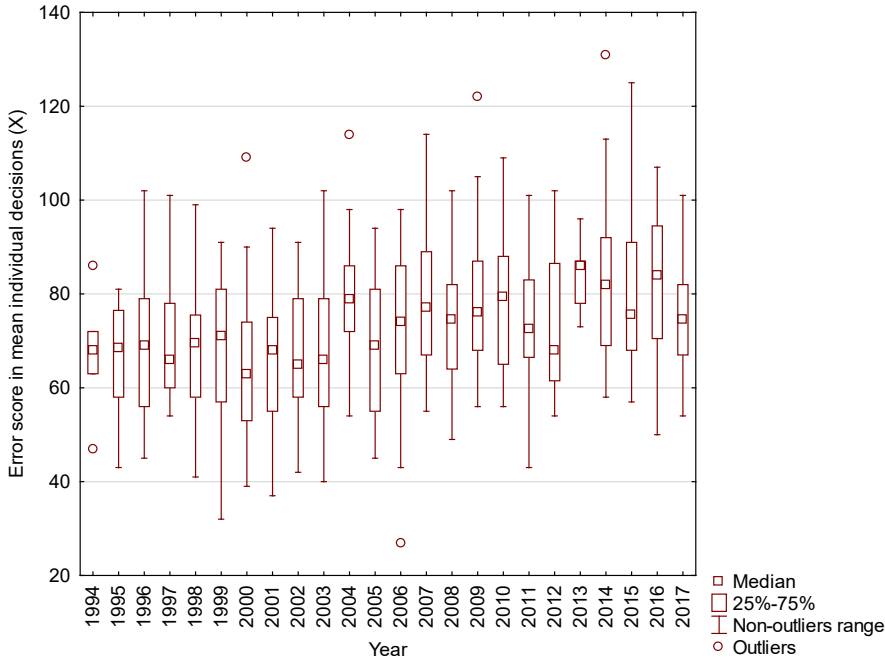


Figure 2. Annual distributions of individual error scores (X_i) from 1994 to 2017

The same analysis was carried for all other distributions of error scores (best individual, worst individual, autocratic, consultative and group). All of them showed the same pattern in time: no tendency in 1994–2003 and increasing tendency in 2003–2017. It was also examined if the distance between median error scores is stable over time. Figure 3 depicts the differences between median error score in autocratic and consultative decisions over time and between median group and autocratic decisions. No tendency is observed for these differences as well as the distances between them are stable over time. Therefore it can be concluded that despite the fact that median error score has been significantly increasing for the decision types after year 2003, there were no changes in the rank of the errors among different types of decisions.

The research participants included postgraduate students of four different programmes. The distributions of scores of individual students by study programme are shown in Figure 4 (left side). The differences in the distributions were significant (Kruskal–Wallis ANOVA $p < 0.0001$), and post-hoc tests were used to identify differing pairs.

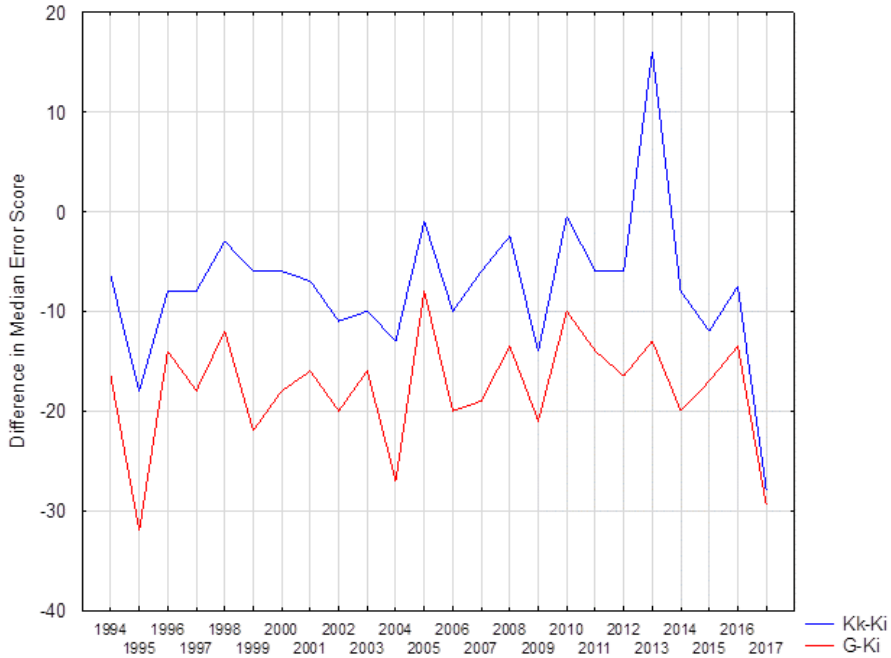


Figure 3. The differences in median score error between consultative and autocratic decisions and between group and autocratic decisions over the years 1994 to 2017

The median of the averaged individual error scores for ZPL – Healthcare Management (78.5) was significantly higher than the others, and the median for the MBA programme (55) was significantly lower. The medians for PSM – Postgraduate Managerial Studies (70) and HR (74) were not significantly different from each other.

Compared to the other participants, MBA students are more likely to hold higher managerial positions and have experience in various decision-making styles, and the lower individual error scores are therefore not surprising. However, the differences between the group decisions and the means of the individual decisions (Figure 4, right side), which illustrate improvement in decision quality, were not significantly different between the different postgraduate programmes (Kruskal–Wallis ANOVA $p = 0.1047$), and there were also no significant differences between the programmes in the improvements from individual decision-making to consultative decision-making (not shown; Kruskal–Wallis ANOVA $p = 0.1194$).

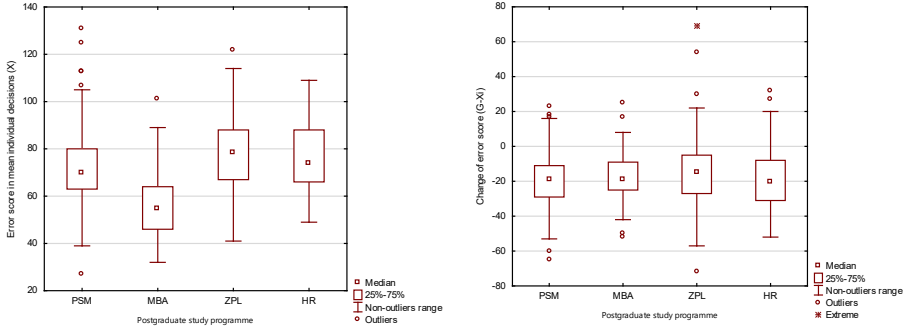


Figure 4. Distribution of results by study programme — individual decisions (X_i ; left) and the change from individual to group decisions ($G - X_i$; right)

Subsequent analyses were for all programmes of postgraduate studies combined.

H1: A team leader who uses team members' direct participation for complex and multi-stage problems increases the probability of a higher quality decision than when making a decision autocratically.

Significant increases in the quality of decisions were achieved by switching from autocratic to consultative (+10.2%) and then to group decision-making (+15.3%); the overall improvement from autocratic to group decisions was also significant (+23.9%) (Table 3).

Table 3. Error scores for different decision-making styles

	Error score (mean)	Standard deviation	Error score (median)
Autocratic decision (K_i)	71.7	25.7	70
Consultative decision (K_k)	64.4	24.1	62
Group decision (G)	54.5	21.6	50

The positive effects of the PDM process are also supported by the structure of the team results. The proportion of teams whose quality of decision-making improved (i.e., lower error scores) ranged from 60% to 76% (Table 4), depending on which decision-making style is used as the starting point for the comparison. Only 21–31% of the teams saw poorer decisions.

Table 4. Effects on decision quality of changing the decision-making style

Change in decision-making style	Number of teams			Percentage of teams		
	Better	Same	Worse	Better	Same	Worse
From autocratic (Ki) to consultative (Kk)	359	51	187	60%	9%	31%
From consultative (Kk) to group (G)	408	36	154	68%	6%	26%
From autocratic (Ki) to group (G)	452	20	125	76%	3%	21%

In summary, the results show that a change in the decision-making style toward greater team members' participation led to lower error scores, and therefore H1 is supported.

H2: A team leader who uses team members' direct participation for complex and multi-stage problems increases the probability of a higher quality decision than the average of the individual members of a group.

H3: A team leader who uses team members' direct participation for complex and multi-stage problems increases the probability of a higher quality decision than the best individual decision from among the team members.

Next two hypotheses concern potential synergy that can be achieved through participation in decision-making. Weak synergy (H2) and strong synergy (H3) values were calculated for both consultative and group decision-making, generating four variables describing the level of synergy (Table 5). These variables are not normally distributed.

Table 5. The value of synergy in various decision-making styles

Synergy	Decision-making style	Formula	Result	Percentage change
Weak cognitive synergy	Consultative	Mean (Xi) – Mean (Kk)	8.3	11.4%
	Group	Mean (Xi) – Mean (G)	18.3	25.2%
Strong cognitive synergy	Consultative	Mean (I min) – Mean (Kk)	-14.6	-29.3%
	Group	Mean (I min) – Mean (G)	-4.6	-9.2%

Consultative and group decisions achieved weak synergy – lower error scores than the average individual errors in the team – reducing the error values by 11% and 25%, respectively. Consultative decisions achieved better decisions than the average of the individual decisions in 71% of the teams, and group decisions were better in 88% of the teams (Figure 5). Both decision-making styles, however, produced worse results than the best individual in the

team – in other words, there was no strong synergy. It is worth noting that, through group decision-making, the teams came closer to the level achieved by the best team member. The best team members were, on average, 9% better than the group decisions, but it should also be noted that consultative decisions produced better scores than the best individuals in 19% of teams, and group decisions in 37% of teams (Figure 5).

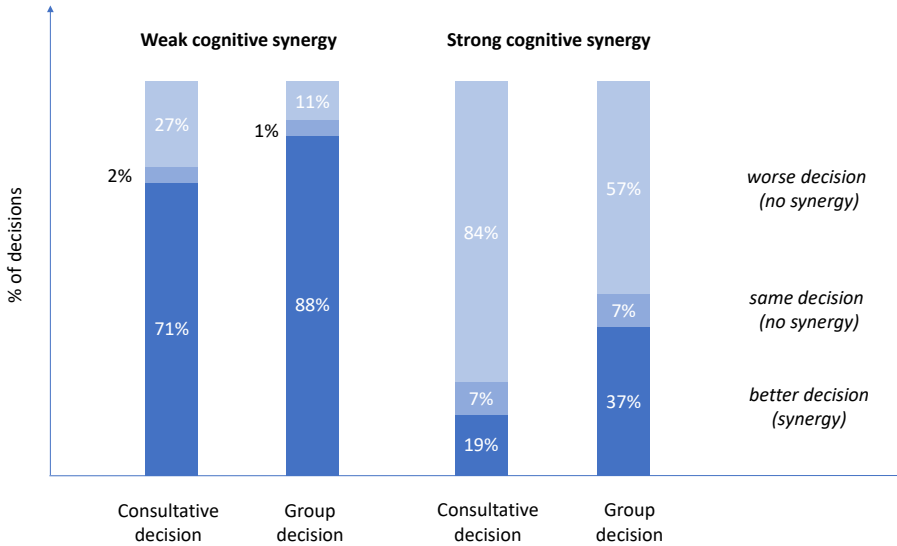


Figure 5. Frequency of weak and strong cognitive synergy in teams

An additional analysis was conducted to determine whether PDM led to similar improvements in the scores of the strongest and weakest teams. Did the weakest teams improve the quality of their decisions to a similar degree as the strongest teams thanks to participation?

For this purpose, we identified two groups:

- 1) The best teams, defined as those in which the mean scores of the team members (X_i) were less than 57.4 (i.e., the error score was at least 20% lower than the average for the entire sample). The number of such teams was 103 (17.2% of the sample).
- 2) The weakest teams, defined as those in which the average scores of the team members (X_i) were greater than 86.0 (i.e., the error score was at least 20% higher than the average for the entire sample). The number of such teams was 113 (18.9% of the sample).

The results indicate that, regardless of the competences of the team members as measured by individual scores, decision quality improved as a result of participation in the decision-making process. The nominal value of weak synergy was slightly lower among the best teams (5.6 vs. 9.3 for consultative decisions, 13.9 vs. 17.9 for group decisions), but it should be kept in mind that improving a good initial decision is more difficult than improving a poor decision. Analyzing strong synergy, it was noted that group decision-making among the best teams (36.5) achieved scores very similar to the best individual scores in those groups (33.8). Strong synergy was worse among the weakest teams (Table 6).

Table 6. Comparisons of strongest and weakest teams

Parameter	All teams N = 598	Best teams N = 103	Weakest teams N = 113
Average of mean scores of individual team members (Xi)	72.7	50.4	95.6
Average of best scores of individual team members (I min)	49.8	33.8	70.7
Average of autocratic decision scores (Ki)	71.7	50.3	94.5
Average of consultative decision scores (Kk)	64.4	44.8	86.3
Average of group decision scores (G)	54.4	36.5	77.7
Weak cognitive synergy: consultative (Xi – Kk)	8.3	5.6	9.3
Weak cognitive synergy: group (Xi – G)	18.3	13.9	17.9
Strong cognitive synergy: consultative (I min – Kk)	-14.6	-11.1	-15.6
Strong cognitive synergy: group (I min – G)	-4.6	-2.8	-7.0

In summary, these results lead to the following conclusions:

- Hypothesis 2 is supported.
- Hypothesis 3 is rejected.

DISCUSSION

Participatory vs. Autocratic decision-making

The quality of decisions was improved by the leader consulting with team members in more than half of the teams (60%), and even more (76%) benefited from increasing participation by using group decision-making. A similar benefit from changing from autocratic to group decision-making was found by Lafferty and Eady (Mączyński, 1996); however, increasing participation is

not a guarantee of better decisions, as poorer decision-making occurred in a small number of cases.

The study answered the question of whether the use of a consultative style mean a significant difference, enabling a decision similar to a group decision, or will it rather be closer to an autocratic decision. The quality of consultative decisions was roughly in the middle of autocratic and group decisions.

It is worth mentioning that a small number of leaders kept their original individual decisions even after consulting with their teams (9%), meaning that a relatively small proportion were "resistant" to the arguments of their team members. In such cases, institutionally forced consultation would simply be a sham.

Cognitive synergy in decision-making processes

The decision-making styles were assessed relative to the average individual result and the best individual result for each team. Consultative decision-making reduced error scores by 11% from the average individual scores, and group decision-making by 25%; weak cognitive synergy was also observed. No previous studies examining consultative decision-making were found, but the findings for group decision-making are similar to those found in the literature; for example, Hamada et al. (2020) found an improvement of 22%, and Hodder (2001) found improvements ranging from 26% to 44%, depending on team size. The analysis of the distribution of results confirms the positive effect of PDM processes in the majority of the teams, with consultations reducing errors in 71% of teams and group decision-making reducing errors in 88%.

Adopting the best individual decision in the team as the benchmark for assessing the consultative and group decisions raises the bar significantly. Both decision-making styles were worse than this benchmark, and strong cognitive synergy was not observed. Compared to the best team members, consultative decisions were 29% worse and group decisions 9% worse, but while the first of these differences is significant, the group decisions were approaching those of the best team members.

The distribution of results shows that, in 19% of the teams, the consultative decision was better than the decision of the best team member, and this almost doubled for group decisions to 37%. In a similar study by Rogelberg et al. (1992), the percentage for group decisions was 13%, while for a modified decision-making style that induced all participants to participate actively in the process, it increased to 56%. However, it should be emphasized that, in the current experiment, about half of the teams (57%) still made poorer decisions than the best team member, which may be a result of

underestimating the best solutions that emerged from the individual team members during Stage 1 and then working on a worse, compromise solution.

However, it should be emphasized that the teams were solving a new problem that they had not dealt with before, so it would not be easy to assess which team member had proposed the best solution. It can therefore be reasoned that, in a situation in which an assessment of the team members' proposals is difficult, group decision-making would permit a decision that may be worse than, but is nevertheless close to, the proposal of the best team member. As a result, the risk of making a very poor decision is minimized.

In summary, the use of the knowledge of team members enables the creation of synergy, which is manifested in the development of a decision that is better than the average performance of the team members (weak cognitive synergy) and sometimes better even than the best individual decision in the team (strong cognitive synergy). This effect was independent of the competences of the team members, as measured by the individual results in Stage 1 of the experiment and confirmed by the comparison of the strongest and weakest teams and of teams studying different postgraduate programmes.

Managerial implication

Decision-making skills are essential for any team leader, the right choice of the decision-making style increases the chances of making the right decision. Researchers point out many determinants of the choice of the decision-making style, e.g., decision problem nature (Davenport, 2011), national and corporate culture (Hammoud, 2011), manager's knowledge and experience (Kozioł-Nadolna & Beyer, 2021), personality (Selart, 2005; Belhekar, 2017), age and gender (Lizárraga et al., 2007), attitude and competence of team members (Leana, 1986).

Nowadays leaders are often expected to deal with multiple tasks or projects simultaneously, so many decisions are taken under time pressure (Ordóñez et al., 2015). In particular, time pressure has been shown to lead people to complete the most pressing task to the exclusion of others (Leroy, 2009) which may induce them to choose one-person decisions, as this do not require more time than necessary to involve additional people in the decision-making process.

In the case of routine, repetitive problems, such an approach might be justified. However, in times referred to by the acronym VUCA (Bennis & Nanus, 1985), more and more decision-making problems are new, complex and multi-stage. In such a case, it is necessary to develop creative and innovative decisions, which is not conducive to autocratic decisions.

Such decision problems were the subject of the experiment in the study described in the article. This research suggests that increasing team members' participation to a consultative role and even better, a full participatory role, increases the quality of such decisions. It is also worth remembering that such decision-making styles provide people with opportunities to have a personal impact on companies, which is particularly important for new generations entering the labor market (Ng et al., 2010). An additional benefit is increased management transparency (Okaka et al., 2023). However, it is worth noting that group decisions do not guarantee a higher quality of solutions. Lower-quality decisions can occur, and there is thus a need to build a culture of accepting risk in the case of new, innovative ventures.

Facing a new, complex, multi-stage decision-making problem, leaders have a consultative and group style at their disposal. The group decision-making style can bring better quality, but it has its limitations and it is not always possible to use it. It requires a team of highly competent members who identify themselves with the interests of the organization. Otherwise, the consultative form will bring better results.

CONCLUSION

The aim of this long-term experiment was to determine the effect on decision quality of changing the form of direct participation in the decision-making process in the case of complex and multi-stage problems. The authors thus sought to identify the scale of potential opportunities and threats resulting from different forms of team members' participation.

The results of the experiment confirm the significant synergistic potential of increasing direct PDM processes for complex, non-routine problems, with scores improving with increased participation. A significant proportion of teams made better decisions as a result of increasing direct participation – replacing autocratic decisions with group decisions. The quality of consultative decisions was roughly in the middle of autocratic and group decisions. This effect was universal, observed both in the strongest and weakest teams.

On the other hand, in most cases the group made worse decisions than the best individual, which confirms the results of previous research (Bonner et al., 2004). Although the quality of group decisions was lower than that of the best team member, compared to other decision styles, it was close to the best team member. Our study shows that group decision-making markedly reduced the risk of making highly misguided decisions, and it can

be reasoned that direct participation protects against serious mistakes more than it guarantees the best possible results.

Using the synergistic potential of PDM requires a number of prerequisites (Anderson et al., 2001), particularly those related to organizational culture, competences, and the attitudes of team leaders and team members. The adoption of group decision-making also requires a superior's trust in the competences of the participants in the decision-making process, the community of their interests, and the credibility of their stated intentions. When trust is limited only to competence, a supervisor should lean toward less effective but safer consultative decision-making.

Traditional teams participated in the study, but to some extent the results of the experiment are relevant to decision-making processes in virtual teams. It seems that the increase in the quality of decisions as a result of the use of the consultative style may also occur in such circumstances. Some limitations may be associated with the group decision-making style results. Communication in virtual teams is associated with various limitations that may hinder the participation of all team members, e.g., lack of non-verbal communication, technical problems, and an unwillingness of some people to participate actively in online meetings (Kloniek et al., 2021; Yang et al., 2021). As a result, a group decision may be the result of the actions of some team members and not bring synergy that occurs in traditional teams.

These results are consistent with experiments that used scenarios in which teams had to make decisions in life-threatening situations. For the first time, an empirical study analyses the case of consultative decision-making, in which the team leader consults the individual opinions independently to finally come up with a final "team" decision. This approach is widely used by team leaders and managers in the field. The composition of the sample should also be emphasized: all were professionally active participants. The nature of the sample and its large size (598 teams, 2,673 participants) convey a great validity to the results of this study.

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Appendix: Sample calculations of error scores after the experiment

Task	Experts' decision	Autocratic decision	Consultative decision		Group decision		
	Ranking	Ranking	Error score	Ranking	Error score	Ranking	Error score
1. Selection of team members	12	16	4	9	3	16	4
2. Tracking the progress of the project	17	9	8	20	3	13	4
3. Identification and preparation of tasks' description	8	3	5	10	2	11	3
4. Development of variants of the project implementation	3	4	1	2	1	2	1
5. Preparation of the schedule	6	5	1	3	3	9	3
6. Correcting individual actions	20	15	5	14	6	19	1
7. Assigning tasks for team members	15	18	3	17	2	10	5
8. Setting the goals of the project	2	1	1	6	4	4	2
9. Team members training	13	20	7	15	2	14	1
10. Review and analysis of the situation in the area of the project	1	7	6	1	0	1	0
11. Defining the necessary competences in the team	10	6	4	13	3	6	4
12. Making changes to the project	19	17	2	12	7	18	1
13. Coordination of implementation activities	16	19	3	18	2	15	1
14. Defining the necessary resources (financial and material)	11	14	3	16	5	8	3
15. Assessment of team members performance	18	12	6	19	1	17	1
16. Evaluation of considered project's variants	4	2	2	7	3	3	1
17. Assessment of the consistency of team and individual goals	14	13	1	11	3	20	6
18. Identifying the decision-making powers needed for the team	9	8	1	5	4	12	3
19. Decision on how to implement the project	5	10	5	8	3	7	2
20. Determination of strategic control points	7	11	4	4	3	5	2
Total			72		60		48

Abstrakt

CEL: Czy zespoły podejmują lepsze decyzje niż jednostki? Dotychczasowe badania przynoszą niejednoznaczne wyniki. Co więcej, partycypacja pracowników w podejmowaniu decyzji może przyjmować różne formy, nie ogranicza się jedynie do decyzji zespołowych. Tymczasem wpływ różnych form partycypacji pracowników w proces podejmowania decyzji był dotąd rzadziej analizowany. Celem niniejszego badania była identyfikacja wpływu wykorzystania różnych form bezpośredniej partycypacji w podejmowaniu decyzji na jej trafność w przypadku złożonych, wieloetapowych

problemów decyzyjnych. **METODYKA:** W artykule zaprezentowano wyniki eksperymentu, w którym wzięło udział 598 zespołów składających się łącznie z 2 673 osób. Uczestnicy trzykrotnie rozwiązywali problem decyzyjny wykorzystując autokratyczną, konsultatywną oraz zespołową formę podejmowania decyzji. Uczestnicy odgrywali rolę członków nowopowołanego zespołu, którego zadaniem było zaplanowanie prac w ramach nowego projektu. Problem decyzyjny był dla uczestników na tyle nowy, aby podczas jego rozwiązywania nie można było zastosować wprost znanych rozwiązań w całości lub części, wskazane było natomiast podejście kreatywne. Następnie rozwiązanie problemu było porównywane z optymalną decyzją wypracowaną wcześniej przez ekspertów. Różnica pomiędzy decyzjami była wyznacznikiem jakości decyzji. **WYNIKI:** Rezultaty eksperymentu potwierdzają potencjał synergiczny tkwiący w uspołecznianiu procesów decyzyjnych w przypadku złożonych, wieloetapowych problemów. Znacząca część zespołów wypracowała trafniejsze decyzje dzięki wzrostowi bezpośredniej partycypacji – zastępując autokratyczną decyzję kierownika decyzjami konsultatywnymi oraz zespołowymi. Dzięki wykorzystaniu tej ostatniej formy zespoły podejmowały trafniejsze decyzje niż przeciętny uczestnik zespołu oraz zbliżały się do decyzji podejmowanych przez najlepszego uczestnika zespołu. Uzyskany efekt był uniwersalny, występował zarówno w najstabszych jak i najlepszych zespołach. Należy jednak pamiętać, że pomimo znacznego potencjału synergii, nie zawsze jest ona osiągnięta. Z drugiej strony, dzięki wykorzystaniu decyzji zespołowych znacząco ograniczone zostało ryzyko podjęcia wysoce nietrafionych decyzji, co oznacza, że taka forma partycypacji bezpośrednio bardziej chroni organizację przed poważnymi błędami niż zapewnia podjęcie najlepszej decyzji. **IMPLIKACJE:** Ważnym elementem warsztatu menedżerskiego jest znajomość i umiejętność wykorzystywania różnych form podejmowania decyzji, w tym związanych z bezpośrednią partycypacją pracowniczą. Zaprezentowane badanie potwierdza zasadność zastosowania formy konsultatywnej i zespołowej w przypadku złożonych, wieloetapowych problemów decyzyjnych. Organizacje, które muszą sobie radzić z szybkim rozwojem technologii, coraz krótszymi cyklami życia produktów i wzrostem konkurencji, wymagają elastycznych struktur wykorzystujących partycypację pracowników na wszystkich szczeblach zarządzania. **ORYGINALNOŚĆ I WARTOŚĆ:** Uzyskane rezultaty potwierdzają wyniki dotychczasowych badań. Wartością dodaną badania jest uzupełnienie autokratycznej i zespołowej formy podejmowania decyzji stosowanej w podobnych eksperymentach o formę konsultatywną. Dodatkowo należy podkreślić wielkość próby badawczej, która jest wielokrotnie większa od prób wykorzystywanych dotychczas w podobnych badaniach. Co więcej, uczestnikami eksperymentu były osoby aktywne zawodowo, w przeciwieństwie do wielu podobnych badań, w których uczestniczyli studenci. **Słowa kluczowe:** partycypacja pracownicza, zarządzanie partycypacyjne, podejmowanie decyzji, jakość decyzji, problemy decyzyjne, formy decydowania

Biographical notes

Ryszard Rutka worked until 2016 as a Professor of Management at the University of Gdańsk. For over 40 years, he has been engaged in research in

the field of organizational behavior management, leadership, and learning organizations.

Piotr Wrobel is a Professor of Management at the University of Gdańsk. He has over 20 years of experience as an educator and researcher. His current interests focus on leadership and organizational culture. The conducted research also concerns the human side of ICT use in organizations, in particular remote work.

Ewa Wycinka is a Professor of Economics at the University of Gdańsk. For more than 20 years, she has been involved in educating students in statistics and quantitative methods. She is the author of over 50 scientific publications and a member of many interdisciplinary research teams. Her current scientific interests focus on the issues of survival analysis, in particular modeling of competing events.

Małgorzata Czerska worked until 2016 as a Professor of Management at the University of Gdańsk. For many years she conducted research on organizational culture, change management, and decision processes. Throughout her professional life, she worked for the development of knowledge about management and its promotion in economic practice and public administration.

Authorship contribution statement

Ryszard Rutka: Conceptualization of the Experiment, Conducting an Experiment, Review & Editing. **Piotr Wróbel:** Review of Previous Research, Writing – Original Draft. **Ewa Wycinka:** Statistical Analysis, Review & Editing. **Małgorzata Czerska:** Conceptualization of the Experiment, Conducting an Experiment.

Conflicts of interest

The authors declare no conflict of interest.

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Bankers' job stress, job performance, and job commitment trajectories during the COVID-19 pandemic

Sanjoy Kumar Roy¹ , Md. Rahat Khan² 
Nazrul Islam Shanto³ 

Abstract

PURPOSE: The global COVID-19 pandemic has profoundly impacted multiple sectors across industries and regions, including medical services, financial institutions, and others. The escalating global pandemic in both emerging and developed nations has resulted in the implementation of stringent lockdown measures and unparalleled disruptions to economic activities. Consequently, individuals have become accustomed to relying on banking operations as a routine aspect of their lives, regardless of the circumstances. Learning how bankers engage with customers in response to the given circumstances would be intriguing. Hence, the study aimed to unearth the relationship between bankers' job stress, job performance, and job commitment, as well as the stress-based job performance and its impact on job commitment during the second to third wave of the COVID-19 pandemic in an emerging market. **METHODOLOGY:** A number of 287 data (response rate 71.75 percent) were collected by online platforms due to the COVID-19 pandemic through the simple random sampling technique. The exploratory factor analysis, confirmatory factor analysis, and structural equation modeling were run to test the proposed research framework with the help of MS Excel 2007, SPSS 22.0, and AMOS 23.0. **FINDINGS:** The findings showed that bankers' work-related stress has a positive impact on job performance but no relationship with job commitment; acute stress has a negative impact on job commitment but no significant relationship with job performance; and stress-based job performance has a significant positive impact on job commitment during the COVID-19 pandemic. **IMPLICATIONS:** The outcomes of this study provide value

1 Sanjoy Kumar Roy, Assistant Professor, General Education Department, City University, Khagan, Birulia, Savar, Dhaka, 1216, Bangladesh, e-mail: mritojonmajoy@gmail.com (ORCID: <https://orcid.org/0000-0003-2847-1288>).

2 Md. Rahat Khan, Assistant Professor, Department of Business Administration, City University, Khagan, Birulia, Savar, Dhaka, 1216, Bangladesh, e-mail: rahatkhan.mrk14@gmail.com; rahatkhan.dba@cityuniversity.ac.bd (ORCID: <https://orcid.org/0000-0002-9197-0365>), corresponding author.

3 Nazrul Islam Shanto, Masters Thesis Student, Rhein Waal University of Applied Sciences, Gladbacher Str. 244 47805, Krefeld, Germany, e-mail: nazrulshanto460@gmail.com (ORCID: <https://orcid.org/0000-0003-3094-4910>).

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to the field of behavioral science by introducing the phenomena of COVID-19 in the context of bankers and emerging economies. The demographic variables and the revealed relationships of bankers' job stress, job performance, and job commitment trajectories would help policymakers rethink stress management practices and policy building in the bank job and the long-term relationship building with their existing employees. **ORIGINALITY AND VALUE:** The novelty of the research is the COVID-19 phenomenon and an emerging economy's bankers' context.

Keywords: work-related stress, acute stress, job performance, job commitment, bankers, COVID-19 pandemic

INTRODUCTION

The banking and financial service sectors are among the most stable and growing industries worldwide (Khan et al., 2022a). The transition to a world economy and deregulated marketplaces has resulted in many significant improvements in the direction (Khan et al., 2022b; Khan & Arif, 2023). Because financial institutions have been organized and offered in past decades, this is especially noteworthy of the industry's structure and performance of work (Hassard et al., 2018; Hossain et al., 2018; Khan & Sharma, 2020). The way banks are structuring and changing dramatically by adopting new technology and structures significantly impacts bankers' job performance (Giorg et al., 2017). Besides the technology disruption, the current ongoing pandemic situation has also created a considerably negative effect on bankers' mental health (Marcu, 2021). The two vital potential sources of stress are organization and personal life. However, the maximum amount of mental stress originates from the workplace (Griffin, 2021). The American Institute of Stress and the UK Workplace Stress Survey consecutively found that 61 percent and percent the stress is caused by the working organization (Mahmud, 2020). A recent study by MetLife revealed that 67 percent of the top decision-makers were not interested in continuing their banking job in the upcoming year if the levels of job stress would not be improved (Pilcher, 2021).

Nowadays, stress is an emerging and worldwide increasing phenomenon for every organization (Ekienabor, 2016; Khan & Rammal, 2022). This universal substance can be expressed in various workplaces and works differently for diverse workers (Michael & Petal, 2009). The organization's size does not matter; stress most significantly impacts employee performance, organizational commitment, and job satisfaction (Li et al., 2021; Wu et al., 2021). In the present era of business, organizations are always looking for multitaskers (Brüning et al., 2021). However, that multi-tasking ability often creates several workplace responsibilities to work for a more extended period and also dedicates them to gaining the expected level of work

performance (Ekiabor, 2016). However, when the management authority or the organization does not properly appreciate the hard work of employees' contribution, it generates stress for the employee, and most of the time, they feel the intention to leave the organization (Stamper & Johlke, 2003). Thus, stress can be considered the employee's dynamic condition that may deal with resource, demand, opportunity, and/or the employee's wishes for the perceived result of vague or vital (Bashir & Ismail, 2010). Such high phases of stress without a managerial solution create a situation of degrading employee performance, jeopardizing an organization's reputation, and a significant failure to retain skilled employees (Ekiabor, 2016).

In the banking sector, almost every level of employee has to face stress (George & Zakkariya, 2015). Bankers are dealing with a massive amount of work stress, and the authority does not measure the effect of stress on job performance (Khalid et al., 2020). Researchers seriously scrutinized the stress-related issues to determine the employees' job performance and commitment that caused high turnover and hindered the organization's objectives and goals (Rizwan et al., 2014). The COVID-19 outbreak wreaked disaster on society and disrupted standards for everyone (Khan, 2020). However, the impacts on frontline workers, such as doctors, healthcare workers, police, volunteers, etc., have been incredibly intense (Rodríguez-Rey et al., 2020). Working physically as frontline workers or working from home, enormous anxiety affects workers' mental health (Galanti et al., 2021). Unlike the other developed countries, in Bangladesh, the lists of frontline workers are comparatively extensive. Besides the medical and healthcare facilities, most of the grocery shops, banks, financial institutions, and garment shops remained open due to energizing the wheel of the national economy (BetterWork, 2020). Till now, 25,399 bankers have been infected during the pandemic, and 133 have passed away; the regular work stresses add more anxiety to bankers' physical and mental health during the COVID-19 outbreak (Prothom Alo, 2021).

A few studies have explored frontline employees' work health during COVID-19 (Galbraith et al., 2021; Yasmin et al., 2021). In earlier studies, most researchers tried to explore the mental health condition of bankers during the Covid-19 crisis, such as psychological impact, performance hampering, work-life balance, work engagement, job satisfaction, digital capabilities, distance leadership, etc. (Khan et al., 2022c; Saleem et al., 2021). A few such earlier kinds of research were also conducted in the Bangladeshi bankers' context. However, separately the components of stress, such as work-related stress (Jackson & Maslach, 1982), acute stress (Kleber & van der Velden, 2009), and job performance-related stress (Coffey et al., 1988), did not measure. Hence, the literature shows a gap between each sort of stress and those impacts on banking job performance and commitment during

the ongoing COVID-19 pandemic. The primary aims of this research were to unearth the relationship between job stress, job performance, and job commitment of a COVID-19 frontline workers' class group and, particularly, narrow down the research on bankers (as frontline workers during the COVID-19 pandemic in Bangladesh). In addition, stress-based job performance and its impact on job commitment during pandemic situations would also be a fascinating investigation.

The authors tried to develop a conceptual framework for selected variables (see Figure 1). The model was tested with the help of 287 Bangladeshi bankers' work experiences during the COVID-19 situation. To unearth the research, the authors attempted to unveil the following three research questions:

- RQ1) Which job stress affects bankers' job performance during the COVID-19 pandemic?*
- RQ2) To what extent does each type of job stress affect bank employees' job performance and job commitment during the COVID-19 pandemic?*
- RQ3) How the stress-based job performances affect bankers' job commitment during the COVID-19 pandemic?*

The underpinning sections have been designed as the literature review and variable definition; the third section explains the research methodology. After that, the fourth section contains results and discussion. Finally, the study ended with implications, the future scope of studies, with concluding remarks.

LITERATURE REVIEW

Job stress and its consequences in an organization

Stress is a reality in everyone regardless of age, religion, gender, organization, or nationality (Iyayi & Kadiri, 2020; Pervin & Khan, 2022). In the research domain, stress in the employed is ambiguous and contradictory and is hardly defined (Kemeny, 2003). The oldest definition of stress is that the body and mind's nonspecific reaction to any stimulus is stress (Selye, 1956). In psychology, stress is defined as the perceived threat accompanying anxious discomfort, emotional strain, and difficulties in adaptation (Fink, 2016). In contrast, Griffin (2021) defined it as an individual's reaction to a potent stimulus (known as a stressor). This stimulus is a major worldwide challenge for employees' physical, mental, and organizational health (ILO, 1986). Stress is an employee's accustomed or coping reaction or a result of negative

emotion that affects psychological and physical symptoms or demands (CahayaSanthi & Piartrini, 2020).

In modern times, job stress is one of the most common job-related diseases for the organizational citizen, affecting employees' feelings (Iyayi & Kadiri, 2020). Typically, job stress originates when the workplace demands are not matched by the employees' ability to overcome such expectations (CahayaSanthi & Piartrini, 2020). In such times, job-related work or responsibilities become troublesome and disgusting, which generates harmful effects on the physical and mental willingness of the employees. Also, role-related factors significantly impact job stress (Rhineberger-Dunn & Mack, 2019). Job stress is a psychological pressure that affects a worker's ability to respond, work participation, physical illness and injury, hypertension, drug abuse, alcoholism, cardiovascular problems (Meneze 2005), family exception, job performance, time to work, grievances, absenteeism, turnover, health care costs, productivity, morality (Ismail et al., 2009; Bashir & Ismail, 2010; Ekienabor, 2016). Those consequences impact job performance and commitment (Summers et al., 2020; Li et al., 2021).

Employee performance

Performance refers to an individual's outcome or competence during specific times of employment compared to the job standard. The objectives or standards were set in advance and are essential for organizational work outcomes and success. Job performance determines an employee's and organizational performance (Khan et al., 2019; Al Ahad & Khan, 2020). Employees can do any work successfully through job performance, which contributes a good role in achieving organizational goals and objectives (Ekienabor, 2016). Job performance is an individual variable or something that a single person can do, and it is a primary affected outcome of stress (Bashir & Ismail, 2010). If the stress level is high, the performance level is low. That means a high-stress level affects employee performance, loss of employment and goal achievement, job satisfaction, and employee commitment (Ekienabor, 2016). Nevertheless, positively imposing human resources can strengthen employees' mental and psychological abilities or capacities and efficiently meliorate their job performance (Law & Guo, 2016).

Organizational and job commitment

Commitment means employee engagement for the employing company or organization; for committing or perceiving (Al Ahad et al., 2020) to provide services for the entire organization and the organization's core support to the

employee (Claudia, 2018). Organizational commitment is an emotional and unique connection or a psychological bond between employees to a specific organization, and the relationship explains the employees' behavior toward the organization (Griffin et al., 2010). It is a behavioral aspect or committed mode of action that employees are enthusiastic about continuing the membership, loyalty, and identity of the organization and giving their level best effort to achieve the organization's values and goals (Griffin et al., 2010; Khan, 2019; Khan, 2021).

Previous research provides pragmatic evidence of the relationship between job stress and commitment. Earlier research revealed a negative impact of job stress on the organization and job commitment (Law & Guo, 2016; Kim & Kim, 2020). As a factor of stress, perceived organizational support significantly impacts commitment levels (Rodriguez-Calcagno and Brewer, 2005). Job stress impacts employee commitment and job satisfaction as well. Employees who are satisfied with their work stress, work conditions, compensations, or policies feel satisfied and committed to the organization (Gazi et al., 2021). Satisfied employees are highly engaged, dedicated, and committed to the organization compared to unsatisfied employees (Iyayi & Kadiri, 2020). Job satisfaction is considered a crucial commitment estimator (Demir, 2020). Whereas commitment is the predictor of turnover, committed employees show better job performance in their respective organizations (Li et al., 2021; Moda et al., 2021).

Work-related stress

Work-related stress is the negative imbalance of stress-inducing demands or expectations about occupational, psychological, physiological, mental, and/or social resources. That is why employees actively take action to care about those demands (Leip et al., 2017). Due to work-related stress, about 20 percent of adults are stressed (Houdmont et al. 2011), 40 percent account for work-related illness, and every year almost 10.4 million working days are lost in Britain (HSE, 2012). Based on the earlier research, several factors were identified for work-related stress in an organization, such as the working conditions in a different country context, manufacturing process, noise, repetitive motion, frequent shift or lifting, salary, co-colleagues relationships, too much workload, frustration, tension, hardness, or distress, discrimination, uncertainty about work, inadequate preparation, short experience, lack of skills, age, and experience, low social support at work, and some others related factors (Capasso et al., 2018; CahayaSanthi & Piartrini, 2020; Albort-Morant et al., 2020; Iyayi & Kadiri, 2020). There have been some contrary research outcomes regarding work-related stress. A few kinds of

research found work-related stress as a negative cause of unfavorable health and socioeconomic consequences. However, several researchers mentioned that it has a positive impact on employee performance, job satisfaction, job commitment, or degree of innovation (Stanton et al., 2002; Van Gordon et al., 2014; Eskandari & Gorji, 2018; Bani-Melhem et al., 2018; Albort-Morant et al., 2020; Iyayi & Kadiri, 2020); So the propositions are:

H₁: Work-related stress significantly impacts employee job performance during the COVID-19 pandemic.

H₂: Work-related stress has a significant positive impact on job commitment during the COVID-19 pandemic.

Acute stress

Acute refers to the discrepancy that occurs unexpectedly, not necessarily that the stressor will be severe (Kleber & van der Velden, 2009). Acute stress may have short-term (Ogungbamila, 2013) and long-standing effects on employee performance or health conditions (Delahajj & Gaillard, 2008). Acute stress guides to an adverse reaction that turns off to concentrate with full attention to the current work; as a result of lack of control to work and job performance, fatigue, irritations, absenteeism, burnout, and commitment. In nonsocial contexts, acute stress has an inconsistent effect on making risky decisions, and stress makes employees make less risky decisions and job performance and commitment (Ellis, 2006; Regehr et al., 2008; Kleber & van der Velden, 2009; FeldmanHall et al., 2015; Iyayi & Kadiri, 2020). So the propositions are:

H₃: Acute stress significantly negatively impacts employee job performance during the COVID-19 pandemic.

H₄: Acute stress significantly negatively impacts job commitment during the COVID-19 pandemic.

H₅: Stress-based job performance significantly impacts job commitment during the COVID-19 pandemic.

Conceptual framework and hypotheses

This study intended to test the impact of work-related and acute stress on employee performance and job commitment in the context of Bangladeshi bankers during the COVID-19 pandemic. Figure 1 depicts the proposed conceptual framework. The conceptual framework was developed based on earlier research (Ellis, 2006; Regehr et al., 2008; Eskandari & Gorji, 2018).

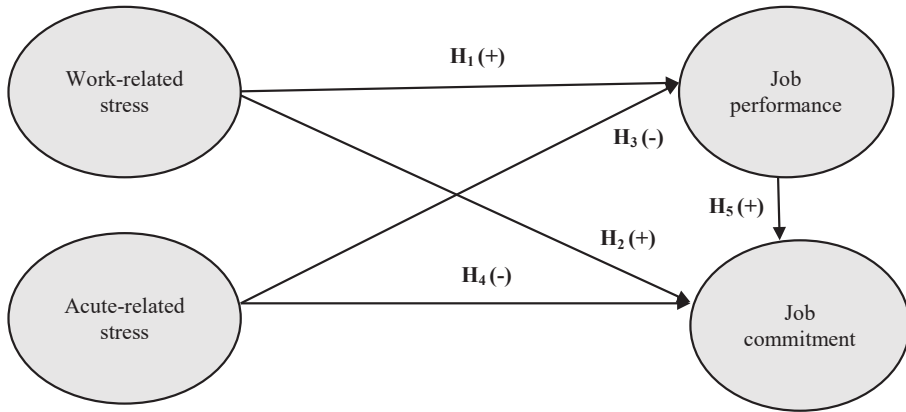


Figure 1. The proposed conceptual framework

RESEARCH METHODOLOGY

This study aims to understand bankers' job performance and commitment to the demands, needs, and expectations of globalization by dealing with work-related and acute stress during the COVID-19 pandemic. Several previous research works mention that employees' emotions or feelings for the company or the organization are an excellent measurable response to job commitment (Moda et al., 2021).

Sampling technique

The study was quantitative, based on the primary type of data. To test the proposed model, the study picked up bankers working in Dhaka city as frontline workers during the second to third waves of the COVID-19 pandemic (September 2020 to July 2021) in Bangladesh (Huq, 2021). Dhaka is the capital of Bangladesh, and most of the banking congregations and all the banks' head offices are Dhaka-centric (Khan et al., 2018; BankInfo, 2021; Khan et al., 2022a). In Bangladesh, the total number of banking employees is 175,027, excluding the bankers of the central bank (Ahmed & Rahman, 2020). For such a large population, the authors picked 400 samples (>200) based on simple random sampling from the bankers suggested by (Iacobucci, 2010). In addition, the study also justified the selected sample with the help of the Raosoft calculator (<http://www.raosoft.com/samplesize.html>). A concise overview of the sample's characteristics is provided in Table 1.

Item development and questionnaire

To develop the item for measurement, the authors did an extensive literature survey to develop a structured questionnaire (Roy & Ahmed, 2016). There were two parts to the questionnaire. The first part contains the respondents' demographic description, and the second part includes job-related stress, acute stress, employee performance, and job commitment-related questions. At first, data was collected for identifying exploratory variables, which were collected by reviewing the literature. After reviewing the literature deeply, 28 variables are finalized and converted into a single question. Seven items for work-related stress (*large amount of work, work time pressure, work hard, lot of physical work, atmosphere of workplace, lot of mental work, constantly thinking about work*) were taken from (Ismail et al., 2009; Moustaka & Constantinidis, 2010; Evanoff et al., 2020); eight items (*very active, full of energy, felt irritable, felt exhausted, felt tense, felt restless, depressed, heart palpitations*) for acute related stress were taken from (Kleber & van der Velden, 2009; Naish et al., 2019), seven items (*self-motivated, enjoy my work, well trained, duties and responsibilities, receive respect from colleagues, manager encouragement, positive feedback*) for employee performance taken from (Ekienabor, 2016; Nguyen et al., 2020), and finally six items (*highly motivated and satisfied, happy to spend the rest of my career, job responsibility, obligation, continue career here, not interested to leave organization*) for job commitment taken from (Griffin et al., 2010; Law & Guo, 2016).

Data collection and measure

This research study used a 5-point Likert scale measuring strongly disagree (1) to strongly agree (5) to collect data from the bank employees (Willits et al., 2016). In addition, some earlier researchers applied such a scale to evaluate employee's emotions and experiences with job stress, employee performance, and job commitment for gathering employee's attitudes (Lambert et al., 2016; Li et al., 2017; Almazroue et al., 2021; Khan et al., 2022c). Likert data types help reduce the skewness of the model's variables (Maddox 1985). After carefully checking, scrutinizing, and editing, only 287 questionnaires were usable for analysis from 400 surveyed questionnaires. The response rate was calculated as 71.75 percent. Due to the pandemic, the questionnaire was designed through Google Docs. It was circulated to the agreed respondents with the help of social media platforms such as email, messenger, IMO, and WhatsApp (Van Gelder et al., 2020). The collected data were checked and processed with MS Excel 2007, SPSS 22, and AMOS 23. The researcher used Explanatory Factor Analysis, Confirmatory Factor Analysis,

and structural equation modeling to investigate the proposed model's validity (Khan & Roy, 2023). The selected analyzing tools tried to reveal the relationship, whether it exists or not, and test the significant impact of work-related and acute stress on employee performance and job commitment, as well as stress-based job performance on job commitment.

RESULTS AND DISCUSSION

Descriptive statistics

From Table 1, it was found that about two-thirds of the employees are males. Whereas almost 90 percent of the bank employees are middle-aged, about 63 percent are within the age limit of 26–35, and the average age is roughly 34. Service length for the employees is perfect. 73.5 percent of the employees have worked for their organization for 11–15 years. Only 4.5 percent of employees have worked for more than 15 years, and the average length of service is 9.38 years. About 90 percent of the employees are junior to entry-level, and only 3.5 percent are top-level management.

Table 1. Descriptive statistics of the collected data

Variables	Category	Frequency	Percentage	Cumulative percent
Gender	Male	191	66.6	66.6
	Female	96	33.4	100.0
Age group	18-25	14	4.9	4.9
	26-35	180	62.7	67.6
	36-45	80	27.9	95.5
	46-55	8	2.8	98.3
	Above 55	5	1.7	100.0
Service year	Less than 5	42	14.6	14.6
	6-10	211	73.5	88.2
	11-15	21	7.3	95.5
	16-20	8	2.8	98.3
	Above 20	5	1.7	100.0
Hierarchy	Entry Level	36	12.5	12.5
	Junior Level	221	77.0	89.5
	Middle Level	20	7.0	96.5
	Top Level	10	3.5	100.0

The study found that youth and middle age people were amicable in sharing information and expressing their thought. Most top-level and experienced employees are engaged in conceptual issues rather than an organization's operational and technical tasks (Griffin, 2021). Hence, the study focuses on frontline (junior) employees, busy with operational banking tasks, to better understand work-related stress, acute stress, job performance, and job commitment analysis during the pandemic.

Reliability statistics

The collected data were strictly refined, evolved, and validated for the proposed model. An internal reliability test is used to determine research instruments' stability and dependability (Malhotra, 2004). Cronbach's alpha test was run to check the internal consistency and reliability of the 28 items. The internal reliability for 28 items was found to be 0.834, and it exceeded the minimum standard ($\alpha \geq .70$) proposed by Nunnally (1978). Furthermore, the average inter-item correlation was 0.157, which is acceptable because the recommended range is 0.15 – 0.50 (Clark & Watson; 1995).

Exploratory factor analysis (EFA)

At first, an exploratory factor analysis was run for the 28 variables to check the construct validity. For construct validity, varimax rotation was used for the 28 items for extracting the underlying dimensions. The items with low loading and cross loading are deleted to get a reasonable estimate. Finally, EFA confirms 16 items (Table 2 depicts the validated items for measurement) to construct four factors (Chen & Paulraj, 2004). By EFA, 77.40 percent variance was explained by the four distinct factors. All the eigenvalues for these four factors are more than 1, and the factor loadings are greater than 0.60, as suggested by (Hair et al., 2015). Results are shown in Table 2. In this way, construct validity has been tested. The four factors are work-related stress, acute stress, employee performance, and job commitment.

Confirmatory factor analysis (CFA)

The research step was a CFA analysis to confirm the identified 16 constructs from EFA. Researchers ran CFA for testing unidimensionality. It is necessary for construct validation (Rana et al., 2020). By unidimensionality, items are constructed with a single factor. The result shown in Table 2 mentioned that CFA ensured the model's fit about the four factors just like the EFA. From the CFA, it was found that the goodness-of-fit index (GFI) and comparative fit index (CFI) were above 0.90. So it was seen that there was unidimensionality

in all factors. EFA and CFA results indicated that all the variables were valid and reliable. Then, with these variables, a model was designed (see Figure 1), and the relationships among variables were tested.

Model development: Structural equation modeling (SEM)

Construct Validation: The relationship between the exogenous variables (work-related and acute stress) and the outcome variables (employee performance and job commitment) is determined. To estimate the validity of the construct for the proposed model, various regular goodness-of-fit indices were used: normed fit index (NFI), goodness-of-fit index (GFI), adjusted GFI (AGFI), comparative fit index (CFI), Tucker–Lewis index (TLI), the ratio of chi-square statistics to the degree of freedom, and root mean square error of approximation (RMSEA).

The range of GFI, CFI, TLI, NFI values is 0 to 1. A value of more than 0.90 indicates a better model fit (Khan & Roy, 2023). However, the GFI index for a specified model never considers the degrees of freedom. That is why, to overcome this lack, AGFI was developed, and a value of more than 0.80 is expected. RMSEA is another popularly used fit index. It measures how well a model fits (Byrne, 1998) and also considers the complexity of a model.

Table 3. Results of various goodness of fit index

χ^2	df	Sig.	χ^2/df	NFI	CFI	AGFI	GFI	TLI	RMSEA
278.45	96	0.000	2.901	0.918	0.944	0.855	0.898	0.930	0.082

Note: χ^2 = Chi Square; df = Degree of Freedom; NFI = Normed Fit Index; CFI = comparative fit index; AGFI = Adjusted GFI; GFI = Goodness-of-Fit Index; TLI = Tucker–Lewis index; RMSEA = Root Mean Square Error of Approximation.

Weston and Gore (2006) stated that RMSEA is more suitable for a simple model when two models' data fit equally well. For an acceptable model, the RMSEA value will be less than 0.10 (Rana et al., 2020). For fitting a good model, Hair et al. (2015) suggested that RMSEA, χ^2/df , or CMIN/df, and any one of the fit indexes means NFI or CFI or GFI or TLI ensures a good model fit. Since the structural equation model (SEM) met such a criterion, the model fits well. Table 3 displays the estimated results.

Table 2. Results of EFA and CFA (n = 287)

Factor	Items	Code	Factor Loading	Mean	SD	AVE	Eigenvalue	Variance explained (Percent)	α	CFA		
										CR	GFI	CFI
Employee Job Performance	• Self-motivated	JP1	0.918	3.92	0.51							
	• Well trained	JP3	0.908	3.90	0.63							
	• Duties and responsibilities	JP5	0.899	3.74	0.75	0.798	5.302	33.136	0.940	0.927	0.978	0.989
	• Positive feedback	JP7	0.847	3.87	0.73							
	• Felt exhausted	AL4	0.898	1.87	0.80							
Acute Related Stress	• Felt restless	AL6	0.888	1.89	1.00	0.730	3.162	19.761	0.889	0.888	0.970	0.979
	• Depressed	AL7	0.849	2.27	0.99							
	• Heart palpitations	AL8	0.778	2.10	1.13							
	• Highly motivated and satisfied	OC1	0.865	4.03	0.60							
Organizational Commitment	• Happy to spend the rest of my career	OC2	0.841	3.71	0.58	0.712	2.136	13.351	0.891	0.875	0.995	0.998
	• Continue career here	OC5	0.836	3.65	0.73							
	• Not interested in leaving the organization	OC6	0.832	4.06	0.66							
	• Work time pressure	WL2	0.853	3.43	0.83							
	• Lot of physical work	WL4	0.818	3.48	0.66	0.674	1.785	11.154	0.858	0.848	0.994	0.997
Work-Related Stress	• Atmosphere of workplace	WL5	0.812	3.53	0.50							
	• Constantly thinking about work	WL7	0.801	3.98	0.65							

Note: EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis; SD = Standard Deviation; AVE = Average Variance Extracted; CR = Composite reliability; Cronbach's alpha = α ; GFI = The goodness of fit index; CFI = Comparative Fit Index.

Table 4. Structural Equation Model (SEM) with results

Relationship	Standard path coefficient	p	Hypothesis
Work-related stress → Employee job performance	0.412	***	H ₁ (Supported)
Work-related stress → Job Commitment	0.038	0.567	H ₂ (Not Supported)
Acute stress → Employee job performance	-0.075	0.183	H ₃ (Not Supported)
Acute stress → Job Commitment	-0.340	***	H ₄ (Supported)
Stressed-based job performance → Job Commitment	0.280	***	H ₅ (Supported)

Note: *** = P ≤ 0.001 (Significant at 0.01 percent).

Figure 2 shows the standardized path coefficients for the structural equation modeling, and the results are shown in Table 4. The analysis found that the standardized path coefficient provides the direction and significance of the relationships among various factors.

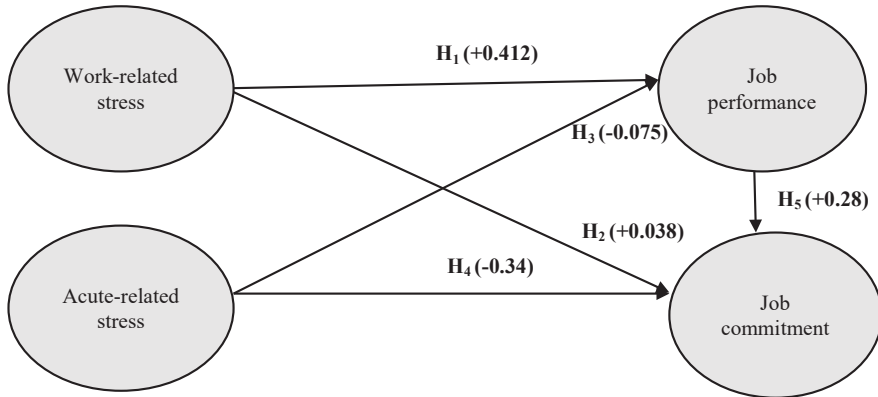


Figure 2. Flowchart of proposed research framework with results

In H₁, it was hypothesized that work-related stress positively impacts employee job performance during the COVID-19 situation. The earlier research altered the hypothesis of the study of Leip et al. (2017). Generally, a few earlier pieces of research outlined that work stress has a negative impact on job performance in a general situation (Van Gordon et al., 2014, Albort-Morant et al., 2020); no relation in a general situation (Rizwan et al., 2014); and positive impact on job performance (Eskandari & Gorji, 2018; Albort-Morant et al., 2020). The most interesting novelty of this H₁ is the pandemic phenomenon. The analysis results strongly support H₁ because the standardized path coefficient, $\beta = 0.412$ with p-value < 0.001, means work-

related stress significantly positively affects employee job performance. So it is said that during the COVID-19 situation, bank employees felt work stress but were happy to perform for their respective banks and consumers.

In H_2 , the hypothesis was that work-related stress positively impacts job commitment during the COVID-19 situation. That means whether the employees are committed to their bank job in high stress. A few earlier types of research revealed that employees were not committed to those jobs, creating more stress (Van Gordon et al., 2014; Iyayi & Kadiri, 2020). However, some other studies outlined a positive relationship between work stress and job performance (Bani-Melhem et al., 2018). Surprisingly, from this particular study, the COVID-19 research phenomenon did not explain the relationship between work stress and job commitment. The results of the path coefficient show the positive direction of work-related stress to job commitment, but the relationship is insignificant as $\beta = 0.038$ ($p > 0.050$).

In H_3 , the hypothesis was that acute stress negatively impacts employee job performance during the COVID-19 situation. Based on the literature survey, too many researchers did not investigate such a relationship. A few earlier pieces of research claimed that such stress has a negative effect on job performance (Kleber & van der Velden, 2009; Iyayi & Kadiri, 2020). However, the authors found no literature supporting a positive relationship. This research results of the path coefficient also show the negative direction of acute stress on employee job performance, but the relationship is insignificant as $\beta = -0.075$ ($p > 0.050$). So it is revealed that acute stress does not impact bankers' job performance during the COVID-19 situation.

In H_4 , it was hypothesized that acute-related stress negatively impacts job commitment during the COVID-19 situation. Like the H_3 , for this hypothesis, a few earlier types of research claimed that such stress has a negative effect on job commitment (Ellis, 2006; Regehr et al., 2008). However, the authors found no literature supporting a positive relationship. The path analysis found that the results support the hypothesis with a negative direction as $\beta = -0.340$ ($p < 0.001$). So it was concluded that acute-related stress has a negative impact on job commitment. That means whether the situation is normal or COVID-19 pandemic related, if the acute stress is not bearable, then acute stress reduces the employee's job commitment.

In H_5 , the hypothesis was that employees' stressed job performance positively impacts organizational commitment. The hypothesis was that employees who feel happy with their performance are likely to be more committed to their work (Aloisio et al., 2019; Gazi et al., 2021). The uniqueness of this hypothesis was stressed-based job performance during COVID-19. The results support the hypothesis since the path coefficient $\beta = 0.280$ ($p < 0.001$). That means stress-based job performance has a significant

positive relationship with employees' job commitment. So it can be said that if the employees accomplish their job very well, they are more committed to staying in this organization. No matter whether the situation is normal or pandemic related.

CONCLUSION, IMPLICATIONS, AND FUTURE RESEARCH

The study investigates the relationship between bankers' job stress, job performance, and job commitment trajectories from Bangladeshi bankers' context during the Covid-19 phenomenon. The study developed a model on selected variables based on the 287 collected data from the bankers. More interestingly, only three were found statistically significant among the five hypotheses. The study explains that bankers' work-related stress positively impacts job performance but has no relationship with job commitment. On the other hand, acute stress negatively impacts job commitment but has no significant relationship with job performance. Finally, stress-based job performance has a significant positive impact on job commitment during the COVID-19 pandemic. According to the study outcomes, all three research questions (RQs) answers were met. To support the bankers during COVID-19 or any normal situation, the policymakers should prioritize mental health. The study powerfully outlines that acute stress harms bankers and the organization. However, in some cases, work stress may be suitable for better job performance. However, long-term work stress may create burnout and even affect employees' commitment to the job and their respective organization (Griffin, 2021).

The core limitations of the research were data collection techniques. The authors faced challenges in data collection. Most experienced employees were unfamiliar with the online-based research questionnaire (Hossain & Khan, 2021). Another shortcoming was the busy schedule of the bankers. In addition, the outcomes of this research would not be the exact reflection if the data were collected from outside a busy city like Dhaka. However, the future direction of this research could be the moderation effect between work-related stress to job performance and job commitment and acute stress to job performance and job commitment. Some mediating effects, such as age, gender, experience, and hierarchy, can also be tested with the currently developed model. The work-family balance stress, job performance-related stress, and other established job-related stress will also be tested further. Finally, the ongoing COVID-19 phenomenon and the Bangladeshi bankers' context would be altered with the new normal or/and post COVID-19 era and other emerging markets and employee class groups contexts.

The implications of this study can be classified into two parts. One is research implications, and the other is the managerial implication. Firstly, the developed job stress, job performance, and job commitment model can add value to behavioral science research by introducing the new phenomenon called COVID-19 from bankers' and emerging economy contexts. Secondly, the debate about the impact of job stress on job performance and commitment is still unsolvable and needs further and deeper investigation by behavioral scientists. Thirdly, the bankers' demographic variables such as experience, hierarchy, age, gender, etc., along with the revealed relationships of bankers' job stress, job performance, and job commitment trajectories, would assist the policymakers to rethink more about stress management practice and policy building in the bank job. Finally, the outcomes would also provide good insights to the managers regarding long-term relationship building with their existing employees.

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Abstrakt

CEL: Globalna pandemia COVID-19 wywarła głęboki wpływ na wiele sektorów w różnych branżach i regionach, w tym usługi medyczne, instytucje finansowe i inne. Eskalacja globalnej pandemii, zarówno w krajach wschodzących, jak i rozwiniętych, doprowadziła do wdrożenia rygorystycznych środków blokujących i niezrównanych zakłóceń w działalności gospodarczej. W rezultacie jednostki przyzwyczyły się do polegania na operacjach bankowych jako rutynowym aspekcie ich życia, niezależnie od okoliczności. Intrygujące byłoby poznanie, w jaki sposób bankierzy reagują na klientów w danych okolicznościach. Dlatego badanie miało na celu ujawnienie związku między stresem zawodowym bankierów, wydajnością pracy i zaangażowaniem w pracę, a także wydajnością pracy opartą na stresie i jej wpływem na zaangażowanie w pracę podczas drugiej i trzeciej fali pandemii COVID-19 na wschodzący rynek. **METODOLOGIA:** Szereg 287 danych (wskaźnik odpowiedzi 71,75 procent) zostało zebranych przez platformy internetowe w związku z pandemią COVID-19 za pomocą prostej techniki losowego doboru próby. Przeprowadzono eksploracyjną analizę czynnikową, potwierdzającą analizę czynnikową i modelowanie równań strukturalnych w celu przetestowania proponowanych ram badawczych za pomocą MS Excel 2007, SPSS 22.0 i AMOS 23.0. **WYNIKI:** Wyniki pokazały, że stres związany z pracą bankierów ma pozytywny wpływ na wydajność pracy, ale nie ma związku z zaangażowaniem w pracę; ostry stres ma negatywny wpływ na zaangażowanie w pracę, ale nie ma istotnego związku z wydajnością pracy; a wyniki pracy oparte na stresie mają znaczący pozytywny wpływ na zaangażowanie w pracę podczas pandemii COVID-19. **IMPLIKACJE:** Wyniki tego badania wnoszą wartość do dziedziny nauk behawioralnych, przedstawiając zjawisko COVID-19 w kontekście bankierów i gospodarek wschodzących. Zmienne demograficzne i ujawnione zależności między stresem w pracy bankierów, wynikami pracy i trajektoriami zaangażowania w pracę pomogłyby decydom przemyśleć praktyki zarządzania stresem i tworzenie polityki w pracy w banku oraz budowanie długoterminowych relacji z ich obecnymi pracownikami. **ORYGINALNOŚĆ I WARTOŚĆ:** Nowością badań jest zjawisko COVID-19 i kontekst bankierski wschodzącej gospodarki. **Słowa kluczowe:** stres związany z pracą, ostry stres, wydajność pracy, zaangażowanie w pracę, bankierzy, pandemia COVID-19

Biographical notes

Sanjoy Kumar Roy is Bangladeshi born and started his journey as a City University, Bangladesh faculty member on 7th November 2012. He is currently working as an Assistant Professor in the general education department. Mr.

Roy earned his BSc and MSc from the University of Dhaka at the Department of Statistics, Biostatistics & Informatics

Md. Rahat Khan is a Ph.D. research fellow at Jagannath University, Bangladesh, working as an Assistant Professor in Management at the Department of Business Administration, City University, Bangladesh. He has three books, thirty-three journal articles, and eleven conference papers. He earned his BBS (Hons) & MBS in Management from National University, Bangladesh, and his MBA in Marketing & Finance from IBA, Jahangirnagar University from Bangladesh. His major research interests are disruptive innovation, sustainability, entrepreneurship development, and the business's behavioral and psychological aspects.

Nazrul Islam Shanto is a Master's student in the degree program International Management and Psychology at Rhine-Waal University of Applied Sciences, Germany, and also doing a module "Intercultural Management" at Francisco de Victoria University (Madrid, Spain). He has a BBA degree in Human Resource Management from City University, Bangladesh. He received a German govt—scholarship (Deutschlandstipendium) from 1st September 2020 to 31st August 2021.

Authorship contribution statement

Sanjoy Kumar Roy: Conceptualization, Methodology, Formal Analysis, Resources, Software, Writing – Review & Editing. **Md. Rahat Khan:** Concept, Methodology, Project Administration, Resources, Supervision, Validation, Visualization, Writing – Original Draft, Writing – Review & Editing. **Nazrul Islam Shanto:** Data Curation, Investigation, Writing – Review & Editing.

Conflicts of interest

The authors declare no conflict of interest.

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Entrepreneurship education for women through project-based flipped learning: The impact of innovativeness and risk-taking on course satisfaction

Seung-chul Yoo¹ , Tu Anh Truong² 
Kwanghee Jung³ 

Abstract

PURPOSE: The primary aim of this research is to explore the correlation between learners' characteristics and the perceived value and satisfaction associated with Project-Based Flipped Learning (PBFL) methodologies. A secondary objective involves investigating how these PBFL methodologies can be employed to enhance the quality of entrepreneurship education for women. **METHODOLOGY:** During the first semester of 2018, a total of 80 students enrolled in the Communication Society class were engaged in a longitudinal study, involving bi-weekly online surveys prior to the semester's conclusion. The survey instruments utilized Likert-scale measurements, with a 5-point scoring system. The data acquired was subsequently analyzed using structural equation modeling, which facilitated the examination of both the pre- and post-change scores and the structural properties of their relationships with overall course satisfaction. In terms of statistical evaluation, the study employed Generalized Structured Component Analysis (GSCA), a powerful component-based SEM technique, thus ensuring a robust and academically rigorous interpretation of the data. **FINDINGS:** Our research sought to understand the effects of learners' characteristics, specifically innovativeness and risk-taking, on course satisfaction in Project-Based Flipped Learning (PBFL). We found that female learners' innovativeness positively influenced their perception of the project's entertainment and educational value, which in turn increased preference for PBFL and course satisfaction. Interestingly, risk-taking did not significantly influence perceived project value, which provides

1 Seung-chul Yoo, Associate Professor, Division of Communication and Media, Ewha Womans University, 52, Ewhayeodae-gil, Seodaemun-gu, Seoul 03760, Republic of Korea, e-mail: communication@ewha.ac.kr (ORCID: <https://orcid.org/0000-0002-4550-4099>).

2 Tu Anh Truong, Research Assistant, Division of Communication and Media, Ewha Womans University, 52, Ewhayeodae-gil, Seodaemun-gu, Seoul 03760, Republic of Korea, e-mail: truongtuanh192ccg27@ewhain.net (ORCID: <https://orcid.org/0000-0003-0103-1143>).

3 Kwanghee Jung, Associate Professor, College of Education, Texas Tech University, 2500 Broadway W, Lubbock, USA, e-mail: kwanghee.jung@ttu.edu (ORCID: <https://orcid.org/0000-0002-7459-7407>), corresponding author.

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*insights into the role of personality traits in learning outcomes. **IMPLICATIONS:** Our study invigorates entrepreneurship education theory by highlighting the key role of learner innovativeness in PBFL course satisfaction, urging a nuanced examination of personality traits in educational contexts. Further, we question the established importance of risk-taking, necessitating a critical reassessment in this domain. These pivotal theoretical contributions challenge prevailing assumptions, enrich scholarly discourse, and open new avenues for research. On the practical side, our findings emphasize the imperative of fostering innovativeness in women's entrepreneurship education. These insights underscore the need for a strategically tailored, creative learning environment, with the potential to enhance learner engagement and satisfaction significantly. In sum, our research generates transformative theoretical insights and provides actionable strategies for improving the practice of entrepreneurship education. **ORIGINALITY AND VALUE:** Our research presents a novel approach to fostering women entrepreneurs in the media sector through PBFL. This unique focus on the intersection of gender, media entrepreneurship, and PBFL distinguishes our study from existing literature. Furthermore, our findings offer educators invaluable guidance for enhancing female entrepreneurship education, thereby enriching the pedagogical landscape of this domain.*

Keywords: entrepreneurship education, women entrepreneurship, project-based flipped learning, innovativeness, risk-taking, course satisfaction

INTRODUCTION

In the past decade, the business landscape has experienced substantial changes, ushering in a notable increase in the participation of women entrepreneurs. This upward trend aligns with growing societal demands for enhanced gender diversity in the workforce. Indeed, women have proven to be markedly effective in the business environment, excelling in numerous emotional and social intelligence competencies (Korn Ferry Hay Group, 2017). These competencies, coupled with the value-adding influence of women in leadership roles (Adams & Ferreira, 2009), underscore the imperative to further women's representation in entrepreneurship.

Our study is situated within the context of South Korea, a country that has seen remarkable strides in technological advancement and digital media consumption. This focus on South Korea is academically significant as it offers a unique opportunity to explore the dynamics of women's entrepreneurship education in an environment that is at once technologically progressive and traditionally conservative. From a practical standpoint, understanding this context could offer valuable insights for other societies undergoing similar transitions. This paper specifically investigates the media industry, an area that has seen an unprecedented boom in South Korea and globally. The choice of the media industry is particularly apt for our study as it is a field where

creativity and innovation – key traits fostered through entrepreneurship education – play significant roles. Furthermore, with its wide influence and reach, the media industry can serve as an effective platform to encourage and showcase women’s entrepreneurship. Through the lens of Project-Based Flipped Learning (PBFL), we examine the influences of learners’ characteristic factors, such as innovativeness and risk-taking, on the perceived value and satisfaction of PBFL classes. Our research aims to contribute to the field of entrepreneurship education by providing insights into how PBFL can be utilized to cultivate these competencies in women, particularly in the media industry.

In the consumer market landscape, a notable shift in gender roles, particularly with women assuming responsibility for household finances, has been observed to impact purchasing decisions significantly. Female entrepreneurs, harnessing their inherent understanding of female consumer behavior, have substantially augmented the landscape of business management (Adams & Ferreira, 2009). The development of well-educated female professionals, equipped with astute business acumen, addresses the extant lacuna in potential female entrepreneurial leadership. In the global discourse, the United Nations (2020) has underscored the paramount importance of attaining gender equilibrium as a critical element for substantial and sustainable development. Workplace gender parity has been on a steady upsurge in recent decades, indicative of enhanced inclusivity. Grant Thornton’s Women in Business report elucidates an encouraging increment in the proportion of women occupying executive positions globally. The representation of women in senior leadership escalated from 24% to 29% in 2018 (Thornton, 2019). It is compelling to note that corporations that have proactively fostered female leadership and encouraged gender diversity have also reaped competitive benefits and triggered economic innovation. A striking correlation between increased female representation and higher profitability was reported by Credit Suisse (2016). Businesses where women constituted at least 15% of senior managerial roles exhibited an 18% increment in profitability in contrast to those with less than 10% female representation. Furthermore, enterprises led by female CEOs registered a 19% increase in profitability. Parallely, an MSCI study (2015) indicated that firms with a minimum of three women on their boards reported premium annual returns of equity (10.1%) and superior average valuation (1.76%) as opposed to those bereft of strong female leadership (7.4% and 1.56%, respectively).

Despite the positive strides, a significant gender disparity remains pervasive among entrepreneurs. As reported by Business Insider, the probability of women penetrating the echelons of elite business ranks stands at merely 28% compared to their male counterparts (Sherwin, 2014). Recent data depicts that a scant 6% of CEOs in Fortune 500 companies are women

(Zarya, 2017). An investigation by RobecoSAM (2015) discovered a clear underrepresentation of women in managerial roles across all industries, when juxtaposed with their workforce participation. Particularly in technology-based startups, female leadership remains woefully deficient. Within the technology hardware and equipment industry, there exists a glaring imbalance between the ratio of women at junior and senior management levels (around 10%) and their representation in the broader workforce (approximately 28%).

A comprehensive assessment by Credit Suisse of female senior managers across over 3,150 global companies spanning all industries indicated that while the upper echelons have begun to widen for women, a considerable change in the overall structure has not materialized. This inertia has been attributed, in part, to women's propensity towards stability- and harmony-oriented characteristics when making decisions in business contexts (Embrey & Fox, 1997). Conversely, it has been posited that ingrained gender stereotypes, perpetuated through education, incline women towards safer or more harmony-focused behaviors (Marinova, 2003). This polarization of viewpoints continues to be a topic of scholarly debate (Marinova, 2003; Embrey & Fox, 1997). In summation, both intrinsic attributes of women and educational factors have significant implications on their capacity to assume leadership roles in the business domain.

Within the prevailing context, the call for female entrepreneurship continues to swell, yet numerous obstacles persistently impede their progressive advancement. One potential solution to surmount these barriers resides within the educational structures of universities, specifically by fostering dedicated training programs aimed at nurturing female entrepreneurship. This approach could serve as a catalyst, bolstering women's leadership roles within burgeoning startup ecosystems. As such, the call for entrepreneurship education becomes critical, most notably amongst incoming female university students. However, in spite of these pressing necessities, the current educational landscape in South Korea remains deeply entrenched in theory-oriented pedagogy, favoring knowledge transference over experiential learning and skill acquisition.

This paradigm presents a particular deficit within the media and content fields, sectors where female entrepreneurship's significance is underscored (Byerly, 2011). In these domains, a notable void in education that cultivates managerial skills exists, indicating an urgent need to rethink and reimagine current educational practices to respond to the rapidly evolving demands of these sectors effectively.

In acknowledgement of the growing recognition of women's pivotal roles in entrepreneurship, a critical instrument of societal advancement and

economic evolution (Harris & Gibson, 2007; Bolton & Lane, 2012), it becomes imperative to address the distinct challenges and the gender disparities they encounter. It has been posited that these issues can be effectively attenuated through comprehensive, female-centric educational programs that not only offer specialized content, but also training tailored to their unique entrepreneurial contexts (Bell, 2010). In our discourse on gender dynamics in entrepreneurship, education emerges as a compelling nexus. Detailed and bespoke training for female entrepreneurs can expedite their progress towards achieving parity in a traditionally male-dominated arena, thereby fostering a culture of inclusive and successful entrepreneurship (Bell, 2010).

In the realm of entrepreneurship education, various pedagogical innovations have been trialed, with Project-Based Learning (PBL) emerging as a particularly effective tool (Pan et al., 2020). PBL's integrative approach, coupling curriculum with real-world projects, catalyzes the acquisition of knowledge and the development of competencies, thus promoting critical thinking, cooperation, and independent learning. This stands in stark contrast with the passive reception of knowledge typical of traditional learning methods (Gültekin, 2005). The focus of our investigation on PBL, rather than Project-Based Flipped Learning (PBFL), stems from PBL's broader impact and pervasive application in entrepreneurship education (Thomas, 2000; Larmer & Mergendoller, 2010).

From an academic perspective, our work provides a fresh lens through which to examine the efficacy of PBL in fostering entrepreneurship education among women—an area yet to be exhaustively researched (Okudan, 2006; Cho & Brown, 2013). The benefits of PBL are manifold, including the enhancement of practical skills such as problem-solving, communication, and organization (Fitzsimons & Turner, 2013; Konrad et al., 2020), underscoring its effectiveness as an educational methodology for nascent entrepreneurs, especially women (Dragoumanos et al., 2017).

In light of the seismic shift towards online education in the wake of the COVID-19 pandemic (Baeten et al., 2010; Barak & Dori, 2005), the pedagogical implications of PBL and the potential extension of this approach to PBFL in a hybrid educational model become of cardinal academic and practical interest. A unique facet of our study lies in its exploration of the reciprocity between entrepreneurial characteristics and the outcomes of PBL classes—a research angle that remains under-explored (Shih & Tsai, 2016; Ye et al., 2017).

The main research questions (RQs) are:

RQ1) How do students' entrepreneurial-orientated characteristics such as innovativeness and risk-taking influence their PBL adoption?

RQ2) Which entrepreneurial-orientated characteristic has a significant effect on the perceived values of PBFL courses?

RQ3) Which perceived value has a significant effect on PBFL course satisfaction?

THEORETICAL BACKGROUND

Female entrepreneurship in the new media industry

Female entrepreneurship pertains to business enterprises conceptualized, initiated, and managed by women (McAdam, 2013). This gender-specific entrepreneurial activity has been articulated in the media sectors as a “gendered phenomenon” (Jennings & Brush, 2013), underscoring the gender disparities inherent in entrepreneurial pursuits (Reynolds et al., 2004). In recent times, female entrepreneurs have emerged as proactive and increasingly influential figures within media organizations, distinguished by their characteristic innovativeness and proactiveness, key determinants of entrepreneurial business success (Hang, 2020).

The advent of technological advancements and information and communication privatization has yielded a plethora of opportunities for the inception of new media enterprises. The proliferation of new media, catalyzed by the widespread utilization of the internet, mobile, and social media technologies, has spurred multi-platform media content delivery, a trend that has garnered attention in entrepreneurship studies (Hang, 2020). These nascent conditions necessitate entrepreneurial skills as a prerequisite for professionals seeking to carve a niche within innovative media companies and new media startups. Given that content production is integral to media operations, the media industry is synonymous with the content industry (Hang, 2020). As such, entrepreneurial pursuits within news and content production demand a suite of entrepreneurial traits including innovativeness, creativity (Hang, 2020), as well as risk-taking and revitalization capabilities (Vos & Singer, 2016).

At the micro-business level, the ubiquity of social media platforms presents a fertile ground for online entrepreneurs, notably women (Mukolwe & Korir, 2016), to identify and exploit innovative market opportunities (Park et al., 2017). Historically, women entrepreneurs experienced formidable challenges in establishing a presence within traditional media, primarily due to economic and social hurdles, such as inadequate financing, limited family support, deficient training, and pervasive gender discrimination (Hossain & Rahman, 2018). In contrast, social media platforms emerge as a strategic tool

for women entrepreneurs, offering considerable advantages in advertising, marketing, and client acquisition (Ukpere et al., 2014). These benefits are largely attributed to their flexible, connective affordances and cost-effective investment (Cesaroni et al., 2017). In this vein, women entrepreneurs can optimize social media platforms by harnessing their exceptional abilities to discern customer needs, foster social relationships, and engage in interactive communication via a community-centric approach (Cesaroni et al., 2017).

Entrepreneurial orientation

Entrepreneurship represents a vital engine for wealth creation in a capitalist society (Cho & Lee, 2018), and also functions as a catalyst for social progression (Schumpeter, 1934). Entrepreneurs, distinguishable from conventional managers or employees, engage in a unique array of innovative and proactive endeavors to establish and foster business ventures. Their ultimate aim is to generate profit through the successful execution and management of these ventures. Extant research has consistently identified three core dimensions constituting entrepreneurial orientation: innovativeness, risk-taking, and proactiveness (Covin & Wales, 2018; Linton, 2019; Rauch et al., 2009).

According to Miller (1983), successful businesses often demonstrate high levels of these three traits. This triadic attribute configuration fosters a propensity for creating high financial and social business performance, thereby positioning these businesses as market leaders (Cho & Lee, 2018). Specifically, 'innovativeness' is the ability to create novel ideas and solutions, 'risk-taking' refers to the willingness to commit substantial resources to opportunities with uncertain outcomes, and 'proactiveness' implies a forward-looking perspective characterized by anticipation and action on future needs and changes. This entrepreneurial orientation is central to the execution of business strategies, and is instrumental in shaping organizational structures, processes, and outcomes.

Building upon this perspective, it becomes clear that the modus operandi of successful female entrepreneurs in media companies, discussed earlier, aligns well with these three dimensions of entrepreneurial orientation. This alignment underscores the vital role that female entrepreneurship plays in contemporary business landscapes, particularly within the dynamic and rapidly evolving media industry.

Innovativeness in women's entrepreneurship

Innovativeness serves as a critical entrepreneurial attribute, embodying the capacity to generate unique, creative ideas, and plan the fabrication

of innovative products through novel processes, enhanced supply chain strategies, and raw resource optimization (Cho & Lee, 2018). As conceptualized by Lumpkin and Dess (1996), a firm's innovativeness constitutes its proclivity to encourage and foster new ideas, creativity, and the development of pioneering products and solutions. In the realm of entrepreneurship, innovativeness underscores the active pursuit of unique and inventive ideas, along with the experimentation necessary to uncover fresh opportunities and solutions or accelerate the evolution of new technology, products, or services (Linton, 2019). As a salient characteristic of the entrepreneurial mindset, highly innovative entrepreneurs perpetually seek and identify novel business opportunities, thereby instigating new value streams for corporate development (Brockhaus, 1980). The innovative trait necessitates a substantial propensity for experimentation (Kyrgidou & Spyropoulou, 2012), serving as a catalyst for market condition transformation, thereby facilitating the identification and exploitation of emergent market opportunities (Hult et al., 2004). As such, innovativeness emerges as a critical component of entrepreneurship, engendering business value through significant changes, creative ideation, and inventive amalgamations (Cho & Lee, 2018).

Project-Based Learning (PBL) serves as an educational paradigm designed to stimulate learner creativity (Munakata & Vaidya, 2015), a factor positively correlated with innovation performance (Baron & Tang, 2011). Additionally, creativity functions as a mediator between knowledge breadth and innovation performance (Del-Corte-Lora et al., 2016). Given that PBL classes cultivate a creative milieu for students, those inclined towards innovativeness often exhibit greater interest in such courses, thereby enhancing their innovative performance. Real-world projects afford students considerable freedom and boundless opportunities to explore new ideas and deliberate on optimal solutions (Pan et al., 2019). Consequently, individuals with high innovativeness derive significant entertainment and educational value from the PBL program, thereby augmenting their PBL preference and satisfaction

H1: Innovativeness positively influences perceived entertainment in PBFL.

H2: Innovativeness positively influences perceived educational value in PBFL.

Risk-taking in women's entrepreneurship

Risk is intrinsically linked with concepts of risk–return trade-off (Linton, 2019), probability of loss (Lechner & Gudmundsson, 2014), and uncertainty tolerance (Gunawan et al., 2015). Expanding on the notion of potential loss, Miller and Friesen (1982) have posited risk-taking as the extent to which entrepreneurs

willingly commit to high-stake, precarious resource allocations that carry substantial prospects of failure.

Pioneering thinkers such as McClelland (1961) proposed that entrepreneurs, being individuals who actively pursue lofty ambitions and seek challenging tasks, are prepared to accept significant risks when the potential benefits surpass associated losses. This acceptance involves managing the inevitable hazards intrinsic to their undertakings (Brockhaus, 1980). It is thus incumbent upon entrepreneurs to recognize and mitigate business risks, even while exploiting lucrative opportunities amid high uncertainty (Cho & Lee, 2018) and substantial resource commitments (Lumpkin & Dess, 1996).

Recent studies have shown that emotional well-being and environmental support can boost motivation and entrepreneurial intent, even amid depression symptoms (Lim et al., 2020). This suggests the integral role that social capital plays in mitigating negative emotions and fostering the entrepreneurial drive among individuals. Understanding individuals' risk tolerances is of crucial importance for educators and policymakers (Xie et al., 2003). Early exposure to risk as an educational topic may foster intuitive understanding and enhance decision-making abilities in risk-charged situations (Fesser et al., 2010). Advanced skills could thus bolster students' confidence in their entrepreneurial prowess and promote successful outcomes (Cho & Lee, 2018).

Project-Based Learning (PBL) can have a profound influence on students' risk-taking behavior, given the relevance of risk-taking in entrepreneurship. The real-world business projects involved in PBL provide concrete consequences for students' performance, likely enhancing the enjoyment of high risk-takers and drawing their attention to the course content. However, it must be noted that gender differences and individual levels of risk tolerance influence perceptions of PBL (Sharma, 2015). Specifically, individuals with a greater propensity for risk-taking are likely to perceive increased entertainment and educational value in PBL, thereby augmenting their preference for and satisfaction with the program. Therefore, we posit that risk-takers will find greater value in PBL, reinforcing its relevance for fostering female entrepreneurship.

H3: Risk-taking positively influences perceived entertainment in PBFL.

H4: Risk-taking positively influences perceived educational value in PBFL.

Perceived entertainment in project-based flipped learning education

Enjoyment, as a construct, has been interpreted as an output of emotional engagement (Khalil & Rintamaki, 2014), encapsulating positive affective

responses such as pleasure, approval, and fun (Scanlan & Simons, 1992). This reflects an individual's perceived entertainment value (Khalil & Rintamaki, 2014). Within an educational context, enjoyment corresponds to the degree to which learners perceive their academic activities as gratifying and fulfilling (Davis et al., 1992). Crucially, perceived enjoyment reflects students' cognitive immersion during the learning experience, a pivotal element of academic engagement. An increased enjoyment of the learning experience can lead to a more intense absorption in educational content with, consequently, augmented learning outcomes (Gomez et al., 2010). This underscores the essential link between perceived enjoyment and effective learning.

Project-Based Learning (PBL) methodologies have been demonstrated to improve educational outcomes compared to traditional programs (Boaler, 1999). This is attributed to the creation of an environment that is perceived as "enjoyable, entertaining, and meaningful" (Gültekin, 2005), which fosters academic success. The Buck Institute for Education (n.d.) further asserts that PBL is "an effective and enjoyable way to learn" that cultivates competencies necessary for future success in academia, career, and civic life.

The experiential, project-solving process inherent in PBL amplifies the entertainment factor in learning. This divergence from the traditional, teacher-centered instruction fosters a richer and more engaging learning experience, which subsequently influences students' preference for Project-Based Flipped Learning (PBFL). In summation, the positive correlation between perceived enjoyment and educational performance highlights the potential of PBFL to enhance academic outcomes, thereby reinforcing the pedagogical value of such an approach, particularly in the context of fostering female entrepreneurship.

H5: Perceived entertainment has a positive impact on PBFL preference.

Perceived educational value in project-based flipped learning education

Perceived value was first conceptualized by Zeithaml (1988) as an overall consumer evaluation of a product's utility, gauged by perceptions of received benefits and given costs. Sheth et al. (1991) further expanded this concept by proposing five fundamental categories of consumption values: functional, social, emotional, epistemic, and conditional. Education scholars Hannaford et al. (2005) and Unni (2005) suggested that these principles of perceived value can be applied to educational services, providing valuable insights for educators to refine their offerings and enhance students' learning

experiences, consequently improving student satisfaction (LeBlanc & Nguyen, 1999; Ledden et al., 2007; Stafford, 1994).

Project-Based Learning (PBL), as conceptualized by David (2008), is viewed as a practical problem-solving approach. Students are given autonomy to select project topics, actively acquire necessary materials, and deliver the completed work. Teachers in this setting transition from conventional content mediators to facilitators, supporting and inspiring student-driven learning (Henry, 2012; Hong, 2018). This shift enhances not only functional value by promoting independent practical skills but also delivers emotional value via perceived entertainment.

Furthermore, PBL fosters social learning, as students have to master crucial interpersonal skills such as communication, negotiation, and collaboration (Bell, 2010). Research has shown that PBL effectively enhances these competencies in higher education settings (Kim & Cho, 2017), mainly by requiring students to manage group dynamics during discussions. This process also boosts students' creative thinking abilities, facilitated by brainstorming, mind mapping, and other idea generation methods (Hong, 2018). Thus, the perceived value derived from PBL directly influences the educational experience's overall worth.

In line with Cronin et al.'s (2000) and McDougall & Levesque's (2000) arguments that perceived value precedes satisfaction, it can be inferred that the perceived educational values inherent in a PBL course may elevate students' preference for and satisfaction with Project-Based Flipped Learning (PBFL). The multidimensional aspects of PBL—ranging from functional to social, emotional, and epistemic values—serve as robust pillars for fostering a high perceived educational value, further strengthening the pedagogical foundation of PBFL.

H6: Perceived educational value has a positive impact on PBFL preference.

Project-based flipped learning education preference and course satisfaction

Satisfaction, within the consumer behavior domain, is traditionally conceptualized as an affective response dictated by the perceived discrepancy between pre-consumption expectations and post-consumption performance, as outlined by Engel et al. (1995) and Oliver (1980). This concept is anchored in the principles of social psychology's balance theory, which posits satisfaction as a reflection of the equilibrium achieved between individual experiences and the associated emotional values (Roh, 2002). Moreover, satisfaction

is broadly construed as the degree of goal fulfillment, harmonizing human needs and desires (Jung & Ko, 2009).

Extrapolating this concept to the educational realm, we introduce the term “class satisfaction”. This is defined as the degree to which a specific class meets or exceeds students’ expectations and encompasses a myriad of elements, including academic performance, participation, and overall learning experience. It represents a complex matrix of both the effectiveness and the enjoyment derived from the class (Kim, 2015). It stands to reason that educators and educational institutions perennially strive to balance the dual objectives of catering to learners’ needs and expectations and fulfilling the pre-determined educational goals of the lecture. However, traditional teaching models—predominantly unilateral in nature—often fall short of maximizing class satisfaction. Their primary limitation stems from the fact that they provide inadequate opportunities for students to express their opinions, intentions, or exchange constructive feedback on educational content (Choi, 2004). This deficit is largely redressed by pedagogical methodologies like Project-Based Learning (PBL). By their inherent design, PBL environments promote active student engagement and enable direct contributions to the learning content, thereby fostering a higher degree of satisfaction compared to conventional teaching methods (Yoo et al., 2020).

Empirical evidence further corroborates the efficacy of PBL in enhancing class satisfaction. For instance, Go’s (2021) exploratory study, which leveraged a project-based flipped learning approach in a design class, elicited increased learning motivation and instruction satisfaction, especially with regard to student interaction, among a cohort of 40 students. Thus, the recognition of the entertainment and educational values inherent in PBL has the potential to amplify students’ preference for the course, thereby heightening the overall course satisfaction. The comprehensive satisfaction derived from PBL, underpinned by its integration of diverse educational values and its facilitation of active, learner-centric engagement, reiterates its potency as a transformative pedagogical strategy in contemporary education.

H7: PBFL preference is positively associated with overall course satisfaction.

Guided by the comprehensive literature review, all the proposed hypotheses have been consolidated into a conceptual framework, designated as Figure 1, to guide the testing of the structural model empirically.

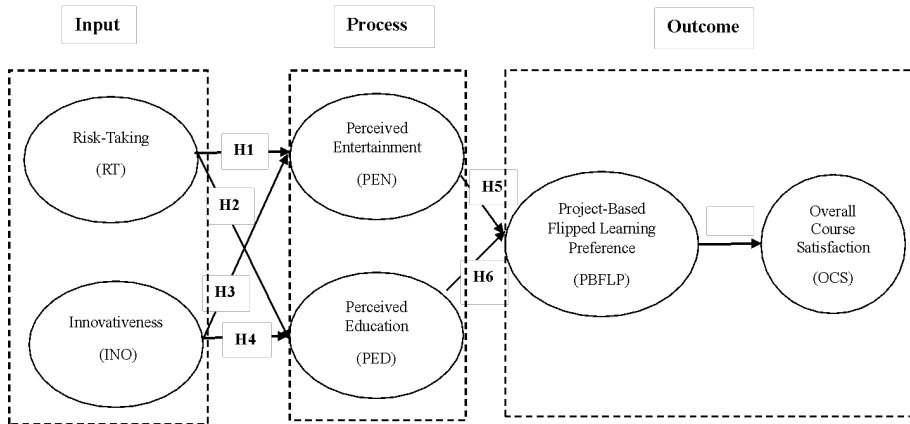


Figure 1. Conceptual framework guiding the empirical research

METHODOLOGY

Data collection

Over a semester, we facilitated a specialized program related to the media business as part of the Communication Society class in a particular university. This program was intended to emulate a practical entrepreneurial environment to foster the entrepreneurial orientation (EO) abilities of potential female entrepreneurs. We administered bi-weekly online surveys to the 80 students who enrolled in the class during the first semester of 2018. The surveys consisted of six constructs: innovativeness, risk-taking, perceived entertainment, perceived educational value, course preference, and satisfaction, all of which were measured using empirically validated scales from existing literature. Responses were recorded on a 5-point Likert scale, with (1) signifying 'strongly disagree' and (5) 'strongly agree'. Supplementary information about the respondents, including student type (domestic or international), year of study, previous experience with project-based learning (PBL), and age was also collected. For privacy protection, all personally identifiable information was anonymized during the data analysis process. After excluding two unreliable responses, we performed our analysis on the remaining 78 valid responses.

Measures

To operationalize the constructs, all the multiple-item measurement scales used in this study were adapted from previous studies. The scales are retrieved from Lumpkin and Dess' (1996) and Covin and Wales' (2012) studies to measure the innovativeness (5 items) and risk-taking (5 items) of learners. A sample item for innovativeness is "I try to be innovative and creative in any situation." A sample item for risk-taking is "I prefer risky but high-performing projects." Perceived entertainment was operationalized using a 4-item scale (e.g., "The project experience was interesting"), and perceived education was measured with four items (such as, "I have acquired new knowledge through the project") as suggested by Pine and Gilmore (1998) and Kwon et al. (2010). To measure course preference, we adopted a 5-item scale proposed by Guglielmino et al. (1987). Finally, course satisfaction is measured using five items retrieved from Joo and colleagues (2008) and Kim (2006). Sample items for course satisfaction are "I am generally satisfied with this lecture" and "I want to recommend this class to others." Each item was measured on a 5-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5). Table 1 shows the detailed scale items and the descriptive statistics of items.

Table 1. Items and descriptive statistics

Construct	Items	Mean	SD
Risk-Taking (RT)			
RT1	I prefer risky but high-performing projects.	3.40	1.02
RT2	I think decisive and courageous action is essential to achieving professional goals despite potential risks.	3.67	0.97
RT3	I prefer to start a business in a high-growth and risky business rather than a low-growth and safer business.	3.49	0.97
RT4	I have a risk-taking sensitivity that raises my expectations for success more than my fear of failure.	3.58	1.00
RT5	I think risk-taking is needed in order to discover uncertain but potential opportunities.	3.84	0.69
Innovativeness (INO)			
INO1	I try to be innovative and creative in any situation.	3.78	0.82
INO2	When undertaking tasks, I actively seek innovative ideas and improvements.	3.74	0.94
INO3	When problems arise, I place greater value on creative and innovative solutions than traditional methods.	3.79	0.82
INO4	I have a leadership style that emphasizes research, development, and innovation.	3.62	0.91

Construct	Items	Mean	SD
Innovativeness (INO)			
INO5	Despite the possibility of failure, I encourage the development of innovative projects.	3.68	0.88
Project Entertainment (PEN)			
PEN1	The project experience was interesting.	3.85	0.89
PEN2	This project got me in a positive mood.	3.79	0.93
PEN3	I enjoyed learning through this project.	3.79	1.03
PEN4	I gained diverse experiences through this project.	4.05	0.97
Project Education (PED)			
PED1	I have acquired new knowledge through the project.	4.12	0.88
PED2	The project activities satisfied my intellectual curiosity.	3.84	0.97
PED3	The project will be helpful for other people's learning as well.	3.99	0.92
PED4	I could learn about media/communication through the project experience.	4.01	0.89
Project-Based Flipped Learning Preference (PBFLP)			
PLP1	Flipped learning classes are more convenient than traditional lecture classes.	4.00	1.01
PLP2	I have memorized lessons in the flipped learning class for a longer time than in the traditional lecture classes.	3.71	1.05
PLP3	The flipped learning class increased my interest in the subject.	3.67	0.99
PLP4	I am generally satisfied with the flipped learning class.	3.99	0.94
PLP5	I want to take flipped learning classes in the future.	3.93	1.02
Course Satisfaction (CS)			
CS1	I am generally satisfied with this lecture.	3.90	0.97
CS2	I want to recommend this class to others.	4.00	0.97
CS3	I think this lecture supported my academic development.	4.14	0.86
CS4	I think this lecture was helpful for my overall university life.	4.01	0.89
CS5	I want to take any additional or in-depth classes related to this course.	3.73	1.07

Note: SD = standard deviation.

Statistical analysis

Generalized Structured Component Analysis (GSCA) was utilized to analyze the data (Hwang & Takane, 2014; Jung et al., 2018). GSCA incorporates both measurement models, which involve the observed variables, and structural models, which capture the relationships between latent constructs, into

a unified framework. This comprehensive approach allows for a thorough examination of the data and its underlying structure.

GSCA falls under the category of component-based Structural Equation Modeling (SEM) methods (Cho et al., 2023). Unlike traditional SEM approaches, GSCA is particularly advantageous in situations where sample sizes are limited, and strict assumptions about data distribution cannot be made (Jung et al., 2018; Hwang et al., 2010). This flexibility makes GSCA suitable for research studies that involve small samples but require a comprehensive analysis of the relationships between variables.

While GSCA is a relatively recent approach compared to other SEM techniques, it has gained acceptance and recognition within the research community. It has been successfully applied in various fields, including social sciences, business, and psychology, to examine complex relationships and identify latent constructs (Hwang & Takane, 2014; Hwang et al., 2021; Cho et al., 2023; Jung et al., 2021).

For the analysis in this study, GSCA Pro (Hwang et al., 2023) was used. GSCA Pro is specialized software designed specifically for GSCA analysis. It provides tailored features and functionalities for model estimation, hypothesis testing, and assessing model fit and validity. By utilizing GSCA Pro, we were able to explore and interpret the data more comprehensively, leading to a deeper understanding of the relationships between variables and enhancing the rigor of the analysis. Basic demographic information on student type (domestic or international), year, prior experience with PBL (yes/no), and age were also analyzed.

RESULTS

The demographic composition of our study participants exhibits a diverse range of backgrounds. Domestic students comprised approximately 60.3% of the total respondents, whereas the remaining 39.7% constituted international students. This diverse blend offers valuable insights, combining both localized and global perspectives in our examination of Project-Based Learning (PBL) outcomes.

In terms of academic progression, the majority of participants were found to be in their initial year of study, with first-year students accounting for 64.2% of the total. Students in their second year of study made up 24.7%, while those in their third and fourth years represented 12.3% and 6.8% respectively. Moreover, prior exposure to PBL methods varied among our respondents. A notable 68.1% of the students had previously engaged with PBL experiences, leaving 31.9% who had not, which underscores the

increasing pervasiveness and importance of PBL methodologies in the contemporary educational landscape. Participants' ages ranged from 19 to 26 years old, with a mean age of 20.44 years and a standard deviation of 1.61. This age distribution is reflective of the traditional undergraduate population, offering a representative sample for this study.

Table 1 delineates the descriptive statistics of the construct items. Intriguingly, all construct means exceeded the midpoint of 3, and standard deviations fluctuated within the range of 0.69 to 1.07. This data variation is indicative of the diverse responses and perceptions of our participants, thereby enriching our understanding of PBL and its role in promoting entrepreneurial skills among female students.

Table 2 provides the loading estimates for the items along with their standard errors (SEs) and 95% bootstrap percentile confidence intervals (CIs) for the lower bounds (LB) and the upper bounds (UB). The CIs were calculated using 1,000 bootstrap samples. For interpretation, a parameter estimate was assumed to be statistically significant at the 0.05 alpha level if the 95% CI did not include a value of zero. The results showed that all the loading estimates were statistically significant, indicating that all those items were good indicators of the constructs. Table 2 also provides the average variance extracted (AVE), composite reliability, and Cronbach's alpha (or coefficient). The AVE is used for evaluating a construct's convergent validity for all items on each construct. The AVEs for all constructs exceed 0, 0.05 alpha, indicating an acceptable convergent validity (Fornell & Larcker, 1981). The composite reliability also showed reasonable reliability for every variable, exceeding the desired threshold of 0.70 (Hair et al., 2019). It also showed that all Cronbach's α surpassed the suggested threshold of 0.70 (Nunnally & Bernstein, 2010), indicating reasonable reliability for the measurement model.

The hypothesized model showed an overall goodness of fit index with a GSCA (FIT) value of 0.694, indicating that the model accounted for 69.4% of the total variance of all the items and their corresponding constructs. Table 3 provides the estimates of path coefficients in the structural model along with their SEs and 95% CIs.

The results showed that innovativeness had a statistically significant and positive impact on project entertainment ($H1 = 0.59$, $SE = 0.16$, $95\% CI = 0.17-0.84$) and project education ($H2 = 0.47$, $SE = 0.15$, $95\% CI = 0.11-0.70$). In turn, project entertainment and project education had a statistically significant and positive influence on PBFL preference ($H5 = 0.57$, $SE = 0.15$, $95\% CI = 0.21-0.84$; $H6 = 0.28$, $SE = 0.16$, $95\% CI = 0.02-0.63$). Moreover, PBFL had a statistically significant and positive impact on course satisfaction ($H7 = 0.75$, $SE = 0.07$, $95\% CI = 0.63-0.87$).

Table 2. Estimates of loadings and reliability measures

Construct	Items	Estimate	SE	95%CI LB	95%CI UB	AVE	Composite reliability	Cronbach's α
Risk-Taking (RT)						0.74	0.93	0.91
	RT1	0.91	0.03	0.85	0.95			
	RT2	0.83	0.05	0.71	0.91			
	RT3	0.84	0.04	0.75	0.91			
	RT4	0.84	0.04	0.76	0.91			
	RT5	0.78	0.05	0.66	0.86			
Innovativeness (INO)						0.71	0.92	0.90
	INO1	0.92	0.02	0.88	0.95			
	INO2	0.93	0.02	0.89	0.96			
	INO3	0.86	0.04	0.78	0.93			
	INO4	0.83	0.05	0.72	0.92			
	INO5	0.75	0.09	0.50	0.86			
Project Entertainment (PEN)						0.87	0.96	0.95
	PEN1	0.95	0.02	0.91	0.98			
	PEN2	0.95	0.02	0.88	0.97			
	PEN3	0.94	0.02	0.89	0.97			
	PEN4	0.88	0.03	0.81	0.94			
Project Education (PED)						0.76	0.93	0.89
	PED1	0.84	0.05	0.75	0.92			
	PED2	0.90	0.02	0.84	0.94			
	PED3	0.88	0.03	0.82	0.93			
	PED4	0.86	0.03	0.80	0.91			
Project-Based Flipped Learning Preference (PBFLP)						0.79	0.95	0.93
	PLP1	0.74	0.07	0.62	0.86			
	PLP2	0.90	0.03	0.84	0.95			
	PLP3	0.90	0.03	0.81	0.94			
	PLP4	0.94	0.02	0.90	0.97			
	PLP5	0.84	0.05	0.75	0.93			
Course Satisfaction (CS)						0.76	0.94	0.92
	CS1	0.89	0.03	0.84	0.94			
	CS2	0.92	0.02	0.89	0.95			
	CS3	0.92	0.02	0.89	0.95			
	CS4	0.85	0.05	0.74	0.93			
	CS5	0.86	0.04	0.77	0.92			

However, risk-taking did not show a statistically significant impact on project entertainment and project education. That is, Hypotheses 3 and 4 were not supported due to the presence of zero values in CIs. (H3 = 0.08, SE = 0.16, 95% CI = -0.20–0.44; H4 = 0.23, SE = 0.17, 95% CI = -0.06–0.57).

Table 3. Estimates of path coefficients

Hypothesis	Estimate	SE	95%CI LB	95%CI UB
H1: INO → PEN	0.59	0.16	0.17	0.84
H2: INO → PED	0.47	0.15	0.11	0.70
H3: RT → PEN	0.08	0.16	-0.20	0.44
H4: RT → PED	0.24	0.17	-0.06	0.57
H5: PEN → PLP	0.58	0.15	0.21	0.84
H6: PED → PLP	0.28	0.16	0.02	0.63
H7: PLP → CS	0.75	0.07	0.63	0.87

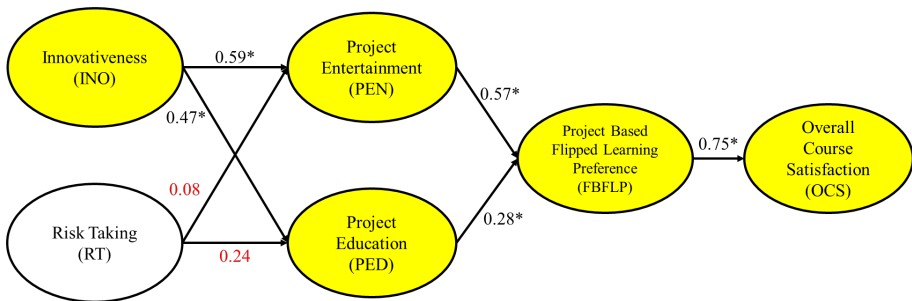


Figure 2 . Results for the Structural Equation Model

DISCUSSION

Our study probed the implementation of Project-Based Flipped Learning (PBFL) within the specialized context of female entrepreneurship education. While the academic community has acknowledged PBFL's potential in promoting optimal learning outcomes, there exists a noticeable knowledge deficit concerning the role of distinctive learner traits—such as gender and other individual characteristics—in shaping course satisfaction. Our research addresses this lacuna in the existing literature.

We sought to illuminate the influence of distinct characteristics prevalent among female students on their embracement and proclivity

towards the PBFL pedagogical model. Our empirical findings underscored the significant influence of innovativeness on female students' perceived project value and the sense of engagement they derived from the learning process. The heightened perception of project-based engagement and educational value was subsequently manifested in a stronger predilection for the PBFL pedagogical approach. This observation is congruent with prior research, such as Kang and Lim's study (2021), which emphasized the pivotal role of flipped learning activities in enhancing the immersion and interest levels among mature e-learners, culminating in elevated course satisfaction. Our findings also demonstrated a direct link between a preference for the PBFL methodology and enhanced course satisfaction among female students. This implies that learners who exhibit robust innovative tendencies derive substantial pleasure and value from the PBFL course, culminating in a strong preference for this pedagogical approach and an increase in overall course satisfaction.

Interestingly, we noted a deviation when considering the factor of risk-taking, commonly recognized as integral to women's entrepreneurship. Our data indicated that this variable did not significantly influence perceived project engagement and educational value. This suggests that within the controlled confines of an academic environment, the variable of innovativeness assumes greater relevance than risk-taking. Learners with a propensity towards risk-taking could perceive classroom-based projects as merely hypothetical scenarios with no real-world consequences attached to riskier decisions. This could potentially dilute the perceived entertainment and educational value derived from PBL courses, subsequently impacting overall course satisfaction.

To engage learners with a risk-taking propensity more effectively, we propose that educators could incorporate elements of tangible consequences, such as rewards or punitive measures tied to their academic performance. This could potentially foster heightened engagement with PBFL courses. In conclusion, our research provides empirical support to the characteristic approach in predicting course success and emphasizes the significant influence of learners' innovativeness on their course preference and satisfaction. This study, therefore, adds a nuanced layer of understanding to the factors influencing the efficacy of the PBFL approach in female entrepreneurship education.

CONCLUSION

The initiation and sustainment of female entrepreneurship are of paramount importance in the rapidly evolving new media industry. The field of media content is inherently aligned with the unique capabilities often associated with women, and there has been a substantial surge in the participation of highly skilled women in the workforce. As reported by Byerly (2011), in Europe, women constituted an impressive majority of junior and senior professional roles in news reporting, with percentages at 78.5% and 70.6% respectively. Moreover, senior female professionals in Europe were approaching parity in key roles such as senior writer, anchor, and producer, occupying 41% of these positions.

Despite these strides, there remains a paucity of instances where women have spearheaded and maintained leadership in media companies. Unraveling the causes behind this disparity is essential. Accordingly, this study holds profound relevance as it seeks to interrogate the characteristics and conditions influencing women's trajectories in entrepreneurship education, offering crucial insights for facilitating their successful foray into media entrepreneurship. This research carries significant implications on the impact of characteristic factors, notably innovation, within the realm of female entrepreneurship education in the Project-Based Flipped Learning (PBFL) context. Our findings challenge the long-held notion of risk-taking as a critical element, underlining instead the potent influence of innovation on course preference and satisfaction within PBFL.

Innovativeness emerges as a key determinant in shaping the perceived educational and entertainment value of the project, leading to an increased inclination and satisfaction with flipped learning. This implies that by refining educational strategies to inspire innovation, we can motivate students to engage more proactively. Such findings echo the research of Huang et al. (2022), whose study showed how business simulation games in a flipped classroom could enhance students' cognitive and behavioral engagement, consequently fostering skills such as creativity, problem-solving, and critical thinking.

The compelling need to bolster innovativeness takes on a distinctive importance in the context of new media entrepreneurship education for women. This is attributed, in part, to the distinctive nature of the media field. Consequently, refining educational content with an emphasis on entrepreneurial innovativeness can prove pivotal and beneficial in PBFL classes. Huang et al. (2022) reiterate this sentiment, demonstrating that female entrepreneurs' innovativeness can significantly boost entrepreneurial performance, with factors like opportunity recognition and psychological capital mediating this relationship.

Our research findings have applicability beyond academia, extending to real-world business practices. PBFL courses create a fertile environment for entrepreneurially oriented individuals, particularly women, to articulate their interests and hone their skills. In the digital era, the growth of social media has become a powerful tool for online entrepreneurs, especially women (Mukolwe & Korir, 2016), enabling them to uncover innovative market opportunities (Park et al., 2017). Despite the challenges faced by small-scale women entrepreneurs in traditional media (Hossain & Rahman, 2018), social media provides a strategic platform for them to market, advertise, and draw clientele (Ukpere et al., 2014) due to its flexibility, connectivity, and cost-effectiveness (Cesaroni et al., 2017).

Successful implementation of PBFL, however, also hinges on educators' abilities alongside learners' traits. Teachers, apart from having deep-seated knowledge, require strong interpersonal skills to maintain an active and vibrant classroom and to establish effective student communication (Wang, 2017). The scarcity of educators well versed in the PBL approach emphasizes the need for focused training and experience building in this pedagogical method (Efstratia, 2014).

Our study is not without limitations. For instance, the sample size and demographics may not represent the entire population of female PBFL students, as it was conducted on a limited population of Korean university students. Further, the uncontrolled environment in which the study was conducted leaves room for external influences on students' performance and course preference.

Notwithstanding these limitations, our research findings lay the groundwork for more comprehensive exploration into nurturing female entrepreneurs in the media sector through PBFL, expected to be a pivotal component in entrepreneurship education. Future studies should engage with diverse samples across varied segments to enhance our understanding of PBFL and women's entrepreneurship education.

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Abstrakt

CEL: Głównym celem tego badania jest zbadanie korelacji między cechami uczniów a postrzeganą wartością i satysfakcją związaną z metodologiami odwróconego uczenia się opartego na projektach (PBFL). Drugim celem jest zbadanie, w jaki sposób metodologie PBFL można wykorzystać do poprawy jakości nauczania przedsiębiorczości kobiet. **METODYKA:** W pierwszym semestrze 2018 r. łącznie 80 studentów zapisanych na zajęcia Społeczeństwo komunikacyjne zostało zaangażowanych w badanie podłuż-

ne, polegające na przeprowadzaniu co dwa tygodnie ankiet online przed zakończeniem semestru. Instrumenty badawcze wykorzystywały pomiary w skali Likerta z 5-punktowym systemem punktacji. Uzyskane dane zostały następnie przeanalizowane przy użyciu modelowania równań strukturalnych, co ułatwiło zbadanie zarówno wyników przed, jak i po zmianie oraz strukturalnych właściwości ich związków z ogólnym zadowoleniem z kursu. Jeśli chodzi o ocenę statystyczną, w badaniu wykorzystano uogólnioną analizę składowych strukturalnych (GSCA), technikę SEM opartą na składnikach, zapewniając w ten sposób solidną i naukowo rygorystyczną interpretację danych.

WYNIKI: Nasze badania miały na celu zrozumienie wpływu cech uczniów, w szczególności innowacyjności i podejmowania ryzyka, na zadowolenie z kursu w odwróconym nauczaniu opartym na projektach (PBFL). Odkryliśmy, że innowacyjność uczących się kobiet pozytywnie wpłynęła na ich postrzeganie rozrywkowej i edukacyjnej wartości projektu, co z kolei zwiększyło preferencje dla PBFL i zadowolenie z kursu. Co ciekawe, podejmowanie ryzyka nie wpłynęło znacząco na postrzeganą wartość projektu, co daje wgląd w rolę cech osobowości w efektach uczenia się.

IMPLIKACJE: Nasze badanie ożywia teorię nauczania przedsiębiorczości, podkreślając kluczową rolę innowacyjności ucznia w zadowoleniu z kursu PBFL, zachęcając do szczegółowego badania cech osobowości w kontekstach edukacyjnych. Ponadto kwestionujemy ustaloną wagę podejmowania ryzyka, co wymaga krytycznej ponownej oceny w tej dziedzinie. Te kluczowe wkłady teoretyczne podważają dominujące założenia, wzbogacając dyskurs naukowy i otwierając nowe ścieżki badań. Od strony praktycznej nasze ustalenia podkreślają imperatyw wspierania innowacyjności w nauczaniu kobiet przedsiębiorczości. Spostrzeżenia te podkreślają potrzebę strategicznie dopasowanego, kreatywnego środowiska uczenia się, które może znacznie zwiększyć zaangażowanie i satysfakcję uczniów. Podsumowując, nasze badania generują transformacyjne spostrzeżenia teoretyczne i zapewniają praktyczne strategie poprawy praktyki nauczania przedsiębiorczości.

ORYGINALNOŚĆ I WARTOŚĆ: Nasze badania przedstawiają nowatorskie podejście do wspierania kobiet-przedsiębiorców w sektorze mediów poprzez PBFL. To wyjątkowe skupienie się na przecięciu płci, przedsiębiorczości medialnej i PBFL odróżnia nasze badanie od istniejącej literatury. Co więcej, nasze odkrycia oferują nauczycielom wskazówki dotyczące doskonalenia edukacji kobiet w zakresie przedsiębiorczości, wzbogacając w ten sposób krajobraz pedagogiczny tej dziedziny.

Słowa kluczowe: nauczanie przedsiębiorczości, przedsiębiorczość kobiet, odwrócone nauczanie oparte na projektach, innowacyjność, podejmowanie ryzyka, satysfakcja z kursu

Biographical notes

Seung-Chul Yoo (Ph.D., University of Texas at Austin), an Associate Professor at Ewha Womans University, specializes in Media Engineering & Entrepreneurship and ADPR/Strategic Communication. His rich professional experience includes key roles at Cheil Worldwide and WPP, as well as a notable tenure as an Assistant Professor of Digital Advertising at Loyola University Chicago. Dr. Yoo's innovative research explores the intersection of

emerging media technologies and marketing communication, with a unique emphasis on persuasion design. His groundbreaking collaborations with industry leaders like CJ Media, KT, and Samsung Electronics have advanced understanding in marketing effectiveness, solidifying his reputation as a leading figure in digital communication.

Truong Tu Anh (M.A., Ewha Womans University) is a Research Assistant at Ewha Womans University. Previously graduating in psychology from the prestigious Ho Chi Minh City University of Pedagogy, she pivoted her focus to the intersection of psychology, advertising, and PR. Her unique insight adds depth to her current research, solidifying her place as an emergent thought leader in the field.

Kwanghee Jung (Ph.D., McGill University), Associate Professor of Educational Psychology at Texas Tech University. He has had extensive hands-on experiences with multivariate analysis (e.g., structural equation modeling, multilevel analysis, latent growth curve modeling, time series analysis). He has also contributed to the development and applications of quantitative methods and advanced modeling methodologies (e.g., generalized structured component analysis and constrained principal component analysis) to diverse issues and topics in human development and education, mental health and disorders, and brain imaging data analysis.

Authorship contribution statement

Seung-chul Yoo: Writing and Planning. **Tu Anh Truong:** Data Collection. **Kwanghee Jung:** Method and Analysis.

Conflicts of interest

The authors declare no conflict of interest.

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