



**Evolving Enterprise Competences  
as a Consequence of Response  
to Changes in the Environment**

**Edited by**

**Anna Ujwary-Gil  
Natalia R. Potoczek**

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## From the Editors

In presenting this issue entitled *Evolving Enterprise Competences in Response to Changes in the Environment*, we want to focus your attention on organizational competence in the context of its competitiveness in the market. The competitive advantage of a modern organization results from competences that enable the adaptation of market mechanisms, internal coordination of activities and resources, consistent building of human potential and development of business capabilities. Organizations' competences in creating innovation, using advanced information and communication technologies (ICT), and building human capital are particularly strongly articulated today.

Organizations in the 20th century were oriented towards creating a sustainable competitive advantage based on key competences that ensured a stable growth in market share. Contemporary 21st-century organizations have understood that gaining a competitive advantage results from competences that allow them to succeed in new fields and quickly reconfigure business models. Every company should know the competences that will enable it to use opportunities, differentiate itself from other market players and implement its own development strategies. The diverse research issues in the collected articles allow you to build and assess a broad perspective of the opportunities that companies use in the market and the various competence gaps that deprive them of these opportunities.

The first article by Mirna Leko Šimić, Antun Biloš, and Josipa Mijoč presents empirical evidence on the relationship between the use of e-business tools and the export efficiency of Croatian companies. The authors set themselves the goal of determining the level of implementation of e-business tools in Croatian exporting companies and examining their impact on export results. In the analysis of the level of implementation of e-business tools, the OECD e-commerce maturity model was used, which measures several aspects of ICT readiness and the intensity of websites and e-commerce in exporting companies. Researchers were able to determine that the implementation of e-business tools in Croatian companies requires improvement, especially in market research, communication, and online sales. An interesting observation is the indication of a higher level of e-business advancement in companies

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oriented on geographically and culturally distant markets (markets outside the EU) in relation to companies exporting mainly to the regional and EU markets. The authors are convinced that the research results can serve as a starting point for making comparative analyzes in comparison with similar economies in terms of market maturity and that this knowledge-building could significantly contribute to developing the competence of exporting enterprises in the field of e-business development.

The article by Aleksander Jakimowicz and Daniel Rzeczkowski refers to the issues of innovation in industrial processing enterprises. The authors analyzed the propensity of enterprises to implement innovation in the years 2012 - 2014 following the negative shock of the global financial crisis in the years 2008-2010. As a result of the conducted research, a relatively low propensity for innovation, and caution in undertaking it, was found. At the same time, a growing tendency to take up activities in the field of eco-innovation and the feeling of a slow reduction in the impact of innovation barriers have been noticed. Appropriate stimulation of the environment and financial support in the field of eco-innovation are examples of overcoming the negative effects of an external shock in the form of psychological barriers and excessive caution in implementing innovation. The authors note that the main value of the article is its innovative and strictly empirical approach to the problems of innovation. The unique and comprehensive analysis of the relationships between sixty-three variables describing the innovation activity of enterprises can become a potential benchmark for similar analyses in the future.

The article by Victoria Konovalenko Slettli addresses the problems of education in the field of transformational entrepreneurship, with a particular emphasis on adults. The author shares the view that transformational entrepreneurship is expressed in the capacity and intended action for change in the life of the entrepreneur and organization, which, in turn, contributes to social change and is characterized by the emergence of a new qualitative dimension of possibilities. The article is based on a pilot study of the implementation of the Transformative Learning Circles (TLC) model in Scandinavian countries, which was developed by the Nordic Network for Adult Learning. The study significantly fits into the development of knowledge about entrepreneurship learning. Key factors affecting entrepreneurship learning have been linked to specific learning processes. In addition, the way of combining these factors in one learning model is illustrated to increase the learning effect of transformational entrepreneurship, which today can be classified as key competences contributing to the development of an enterprise.

The next two articles refer directly to the functioning of people in the organization and constitute an important voice in the discussion on the key competences of the organization in the field of building human capital

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and gaining a competitive advantage. The article by Ambreen Sarwar, Muhammad Ibrahim Abdullah, Muddassar Sarfraz, and Muhammad Kashif Imran presents research on employees working in both public and private sector banks in Pakistan. It proves the relationship between ostracism, stress, and the self-efficacy of employees. As a result of the conducted research, the authors conclude that the self-efficacy of employees, or belief in their own effectiveness, reduces the perception of stress and mitigates the negative effects of ostracism. The study shows that people with a higher sense of self-efficacy would be less affected by the negative effects of stress and ostracism. Although a certain level of stress is considered essential for efficient work, high-stress levels are harmful. Highly efficacious people are less prone to stress in the face of mistreatment; they focus more on their capabilities than on the behavior of others. Perhaps the development of employee's efficacy should be included in the key competences of the organization, especially since the authors recognized self-efficacy as one of the dimensions of psychological capital, along with hope, optimism, and resilience of employees. The authors postulate to examine the impact of these dimensions on the relationship between stress and ostracism or other forms of ill-treatment in the workplace.

The latest article by Michał Ujm and Tomasz Ingram presents research in which the main attention was focused on the impact of human resource management practices on individual employee involvement. Task uncertainty was treated as a moderating variable in the research, which was conducted among members of international teams who are recruiting employees. The authors analyzed the collected material from the perspective of the theory of abilities, motivation, and opportunities (Ability-Motivation-Opportunity theory - AMO). As a result, they verified two research hypotheses and received support for the first hypothesis which proved that AMO practices affect the organizational commitment of employees. The second hypothesis was verified negatively. It has been proven that skills-only human resource management practices do not increase employee involvement. The loyalty of employees who are aware of their competences is not high unless they are properly motivated. The conducted research once again confirms the need to include employee motivation as one of the organization's key competences in its competition strategy.

We hope that the collected articles, as well as the perspective created for their analysis, will allow you to develop an idea of the importance of an organization's competences. Acquiring a competitive advantage requires continuous development of the scope and structure of competences, as was presented in the first article on e-tools in businesses, or continuous stimulation to use them, as illustrated in the article on innovation. Continuous development of the organization's competences is necessary for developing

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business ventures. Initiatives in this area were presented in the third article highlighting the case of Nordic transformation wheels. Equally strongly emphasized are competences used to shape working conditions, stimulating employee attitudes and relationships, and developing the benefits of employee involvement in the company's development.

The editors thank all the authors who wanted to share the results of their research work in the Journal of Entrepreneurship, Management and Innovation (JEMI) and wish all readers the satisfaction of using time well spent reading the collected articles.

**Prof. Anna Ujwary-Gil**, Editor-in-Chief, Institute of Economics, Polish Academy of Sciences in Warsaw, Poland

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# E-business tools adoption and export performance: Empirical evidence from Croatian companies

Mirna Leko Šimić<sup>1</sup> , Antun Biloš<sup>2</sup> ,  
Josipa Mijoč<sup>3</sup> 

## Abstract

*Technology development has enabled companies of all kinds, industries, and sizes to actively participate in international business. Information and communications technology (ICT), and especially e-business tools, are important for the international activities of companies. ICT empowers the company's potential to contribute significantly to economic growth, as it plays a vital role in simplifying business processes and contributes to the improvement of the competitive market presence of a company. The objective of this research is to identify the level of e-business tools adoption in Croatian exporting companies and investigate its influence on their export performance. In the analysis of the level of e-business tools adoption, a partial OECD e-commerce maturity model was used, which measures several aspects of ICT readiness and intensity of web sites and e-commerce in exporting companies. Several distinct aspects of e-business tools adoption were examined, namely e-mail usage, internet usage in market research, promotion, e-commerce, and e-payment possibilities. The export performance level was measured through three elements: the export/total business activities ratio, the export/total revenue ratio and, additionally, the existence of multilingual official websites. Our findings provide enough evidence that e-business tools adoption has a positive correlation to export performance for Croatian exporters. However, it should be noted that three e-business tools adoption factors positively correlate with export performance: namely (1) e-mail use for correspondence with partners/suppliers/buyers, (2) use of the internet as a promotional tool for foreign markets and (3) e-payment use. Two remaining e-business tools adoption factors that were measured – (1) use of the internet as an information source on foreign markets/*

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*buyers/suppliers and (2) online ordering/sales, did not record a significant correlation with export performance. These findings imply that there is still room for better implementation of e-business tools in Croatian exporting companies, particularly regarding market research and online ordering and sales that can contribute to better export performance. With regard to international market geographical orientation, we found significant differences in exporting companies oriented toward geographically and culturally distant markets (non-regional and non-EU markets) that have a statistically higher level of e-business tools implementation in comparison to those exporting dominantly to regional and EU markets. This illustrates the significance of e-business tools adoption for reaching and managing those distant markets that are important for a number of Croatian exporters.*

**Keywords:** *e-business tools adoption, export performance, statistical analysis, Croatian exporters*

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## INTRODUCTION

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Exports play a significant role in the development process. Many governments, in both developed and developing economies, adopt an export-led growth strategy implementing different policies that stimulate exports. International competitiveness that is often a result of such strategies is perceived to be a key development trigger. The significance of exporting activities from both an academic and professional point of view is clearly undeniable (Gregory, Ngo, & Karavdic, 2017; Leonidou & Katsikeas, 2010).

Globalization and trade liberalization processes in recent decades have enabled not only large multinational corporations but also small and medium-sized enterprises (SME's) to compete globally (Spyropoulou, Skarmeas, & Katsikeas, 2010). Increasing numbers of companies globally take part in international trade activities. Their success in international markets can be measured and analyzed in different ways, and one of the most frequently used measures is export performance, which will be used in this research paper.

A number of authors and studies in the last few years have emphasized the importance of ICT (information and communication technologies) and e-business tools implementation in improving overall business performance (Taylor, 2015; Roztocky & Weistroffer, 2015; Gallego, Gutiérrez, & Lee, 2014; Schlichter & Danylchenko, 2013; Voola, Casimir, Carlson, & Agnihotri, 2012; Bordonaba-Juste, 2012;) as well as exports (Makanyeza & Ndlovu, 2015; Lal, 2002; Sorensen, 2006; Sheikh, Shahzad, & Ishak, 2016; Alarcon-del-Amo, Rialp, & Rialp, 2016, and others).

This study seeks to examine the empirical link between e-business tools adoption and export performance in Croatian exporting companies. With the aim of identifying key relations between the two constructs, 111 Croatian

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exporters were included in the study. Different aspects of e-business tools adoption – e-mail usage, internet usage in market research, promotion, e-commerce, and e-payment possibilities were used. Export performance was measured through the export/total business ratio, the export/total revenue ratio and the existence of multilingual official websites.

The research was conducted on a sample of 111 Croatian exporters. To the best of our knowledge, no such research has been conducted either in Croatia or in any of the transition economies in Central and Eastern Europe, which all, more or less, represent developing economies in the European context. We presume that our research results are, to a certain extent, representative for most of those countries too and, therefore, may serve as an indication or a broad reference when comparing to similar economies in terms of market maturity, market size, ICT adoption, and other market attributes.

The paper is structured in the following way. In the introduction section, we describe the purpose and major elements of the research; in theoretical background, we identify key features of two concepts we have researched: ICT along with e-business tools adoption and export performance. The third part of the article is a review of the state-of-the-art of Croatian exports and e-business tools adoption, based on secondary research. The fourth part of the paper explains research methodology and the fifth provides research findings and a discussion. The last part of the paper provides the conclusion with major research findings. Furthermore, a critical overview of the most important research limitations is provided and future research proposal guidelines are included as well.

## **THEORETICAL BACKGROUND**

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ICT is a broad term that includes computerized information and communication technologies such as computers, handheld devices, wired or wireless technologies, and business productivity software. It represents an integration of information, computers, and communication (Ashrafi & Murtaza, 2008; Ghalandari, 2013).

On a global level, ICT is creating a stimulus and a platform for best practice sharing in all areas of life (Schlichter & Danylchenko, 2013) and has evidently “revolutionized and expanded horizons” of many business-related activities (Gosavi, 2017). ICT empowers the potential to contribute significantly to economic growth (Taylor, 2015) as it plays a vital role in simplifying business processes and contributes to the improvement of the competitive market presence of companies in various sectors alike. Bordonaba-Juste (2012) suggested that the usage of ICT implies changes in the companies’

strategy, management, and marketing activities. The ICT contributions to business performance most often mentioned in the literature are non-price competitive elements like product design, marketing, after-sales support, office automation, CRM, SCM and others (Lal, 2004). In addition, Damaskopolous and Evgeniou (2003) and Drew's (2003) research results indicate that ICT also facilitates cost reductions, especially in communication, market research and promotion. All of these findings illustrate the significant contribution of ICT to the international business development of companies.

From a resource-based view, ICT adoption is perceived as a valuable intangible resource that contributes to company innovativeness and competitive advantage (Arcopal-del-Amo, Rialp, & Rialp, 2016) as well as productivity and profitability (Taylor, 2015).

Roztock and Weistroffer (2015) focused on ICT adoption in transition economies. Results from their study revealed that the use of ICT in transition economies "mirrors the transition in the business environment," indicating that significant changes affected entire economies. In addition, they concluded that the early transition phase in Central and Eastern European countries is characterized by a jump in the adoption of ICT. However, evidence shows that business results often failed due to unrealistic expectations and a lack of fundamental understanding of technological possibilities along with market attributes. Later on, companies recognized the need for new approaches to ICT adoption in order to support new e-business models. In addition, there is evidence that some transition economies are increasingly using ICT for strategic purposes.

Furthermore, Gallego et al. (2014) explored the adoption and usage of ICT in manufacturing companies based on a large-scale study in Colombia. Results showed that ICT technology adoption is better facilitated in companies that are relatively large, have large human capital, engage in more innovative activities, and align their organizational structure with the given technology in order to maximize the potential. Mori and Munisi (2012) concluded that if SMEs were to use ICT efficiently, their export performance would most likely improve due to specific technology features that empower extension to the international market.

The level of ICT adoption in a company can be measured in several ways. In this research, we use the partial OECD e-commerce maturity model (OECD, 1999). The model considers three stages for the diffusion of ICT: readiness, defined as an ability to use ICT; intensity, that measures the state of specific ICT applications, primarily e-business tools; and impact, that relates to ICT effects on a company's performance (Mata & Quesada, 2015). Our research uses measures of readiness and implementation and tries to investigate the impact of e-business tools usage on a company, i.e. its export performance.

Export performance reflects the outcomes of export behavior. It represents a degree in which companies achieve their strategic and financial objectives by exporting (Cavusgil & Zou, 1994) and, as such, serves as a basic tool of evaluation of a company's success in foreign markets (Diamatopoulos, 1998). However, it is a complex construct, with no consensus of its determinants. There is a huge variety of different approaches to export performance measurement. According to Chen, Sousa and He (2016) export performance has received increasing attention over recent decades, but the area is still characterized by fragmentation and diversity hindering theoretical and practical development. Madson and Moen's (2018) study identifies 53 different measures of export performance that have been used in recent studies. Aaby and Slater (1989) mention two of the most widely used approaches to measuring export performance: separation of exporters and non-exporters as the first, and rate of growth in export sales and the exports in total sales ratio as the second approach. Shoham (1998) summarized previous studies on export performance and created a model consisting of export sales, export profitability and performance change, as complex dimensions of export performance. Chen, Sousa and He (2016) analyze internal factors (company characteristics, product characteristics, competencies, management attitude, and perception) and external factors (industry characteristics, domestic and foreign market characteristics) as determinants of export performance. Katsikeas, Leonidou and Morgan (2000) discuss export performance as three groups of measures: economic (sales-related, profit-related and market share-related measures), non-economic (product-related, market-related and miscellaneous-related measures) and generic (perceived export success, achievement of export objectives, satisfaction with export performance, and strategic export performance). Several authors focused on specific internal and external export barriers over the internationalization process (Wąsowska, 2016; Cahen, Lahiri, & Borini, 2016; Narayanan, 2015; Kahiya, 2013; Ojala & Tyrvainen, 2007). Zou, Taylor, and Osland (1998) have developed the EXPerf scale that measures three dimensions of export performance: financial, strategic and satisfaction with export. It is widely used in research. Two more scales were developed aiming at optimizing the measurement of export performance: the STEP scale (Lages & Lages, 2004) was developed for purpose of measuring short term export performance, and the APEV scale (Lages, Lages, & Lages, 2005). In this research we concentrate primarily on economic measures of export performance, i.e. we adopt Aaby and Slater's (1989) approach of measuring export performance by growth in export sales and the exports in total sales ratio.

Intuition suggests that ICT could be an important facilitator of exports by reducing costs and barriers to trade. Quite a few studies in recent years have concentrated on the relationship between ICT adoption and export performance. A great majority of these studies point in one direction: ICT and especially

e-business tools are important for the international activities of companies. A recent World Trade Report (2017) states that ICT helps improve situations with insufficient trade information, shortens physical distances, lowers trading costs and improves trade efficiencies at a macro level. Thus, it significantly contributes to both a company and a country's ability to be internationally competitive. However, ITC still can not completely replace human competence and interaction (Makó, Miklós, & Csizmadia, 2012) and includes several risks that have to be accounted for (MacGregor Pelikánová, 2019).

Mathews and Bianchi (2010) and Bennett (1997) state that the usage of e-business tools drives export performance. Pezderka, Sinkovics, and Jean (2012) research found that it increases the efficiency of market transactions and enables easier, cheaper and faster access to information. It means the development of communication with customers and suppliers, cheaper market research bypassing a costly physical presence in a foreign market, employment of advanced export management technology and cost reduction through internet development, which, according to the authors, all have a significant impact on export performance. Rosson's study (2004) emphasizes the role of the internet and its three main roles in improving export performance: as a global marketing tool, a cost-efficient transaction medium and a tool for customer care. Beckers et al. (2007) provided evidence that the internet, a form of ICT, has had a positive influence on the export performance of firms, especially in promoting global visibility at a minimal cost and allowing firms to collect foreign markets data effectively. Gregory et al. (2017) focused on the e-commerce aspect of ICT and its effect on exporting, in a two-stage research approach. They concluded that specific e-commerce activities directly and positively affect distribution and communication efficiency based on a study of 340 exporters, which finally leads to "enhanced export venture market performance."

These authors suggest that, for one to understand the influence of the firm's Internet activity on the export performance of a firm, there is a need to focus on the internet capabilities of the organization. Internet capabilities refer to "a firm's capacity to systematically develop and implement particular internet tools in four functional areas: in informational, transactional, interactive exchanges with customers and in connecting with suppliers" (Beckers et al., 2007, p.1). Depaoli and Za (2013) reported on a research study based on North American and European SMEs and found that e-business solutions are adopted internationally in order to improve performance and gain "tangible financial benefits." However, this study also showed an uneven distribution of the studied approach across regions, industries, technologies and size categories. Furthermore, Eikebrokk and Olsen (2007) focused on the importance of e-business competencies on

the e-business success of European companies. Some aspects of e-business adoption have been reported for UK-based SMEs (Daniel, Wilson, & Myers, 2002). Oliveira and Martins (2010) conducted a study by analyzing the pattern of e-business adoption by firms across European Union countries (27 EU members were included in the research). They concluded that the most important factors to describe e-business adoption are the industry-specific characteristics and not the country of origin, suggesting that certain industries are more inclined to utilizing e-business tools. Export and innovation-oriented companies are proven to be early ICT adopters as well as e-business adopters, based on a large scale study of Colombian manufacturing companies (Gallego et al., 2014).

Results from a study based on SMEs in the manufacturing sector of Zimbabwe suggested that ICT usage positively predicts export performance (Makanyeza & Ndlovu, 2015). However, out of the three dimensions of ICT usage, only relationship building capabilities significantly predicted export performance while market intelligence and marketing capabilities did not. Even though ICT usage is linked with export performance in many different studies and research efforts, there is still a large portion of uncertainty related to these two constructs and their interactions.

### **Croatian exports and e-business tools adoption**

Only about 15% of the total registered active companies in Croatia (153,281 in 2017) (Državni zavod za statistiku, 2018) are exporters. Although it is a rather small proportion, it shows a significant growth compared to 2005, when the proportion was only about 10% (Leko Šimić, Horvat, & Forjan, 2006). These companies currently employ 52% of all employees, invest 62% of total investments, contribute 66% of total sales income and invest in about 73% of total R&D investments. They make up 76% of the total profits in Croatia (Izvozni portal, 2018). These data indicate that Croatian exporters are healthy companies and probably the most important development drivers of the whole economy. An interesting fact is that, although SMEs make up 98.5% of all registered companies in Croatia, they are significantly underrepresented in exports. Their share of exports is only 23% (Singer et al, 2017). Consequently, most export-oriented companies in Croatia are large ones.

Croatian foreign trade is, according to official statistics, strongly concentrated on the EU market (66.4% of exports and 77.2% of imports). In the past few years, the import/export rate is between 60 and 65% (Singer et al., 2017). The main features of Croatian international trade are the increase in export orientation, a huge trade deficit, and a high level of export and import concentration (Butorac, Mikulić, & Palić, 2019). However, compared

to other transitional economies of Central and Eastern Europe in the EU, Croatia holds the last position regarding export share in GDP – it is only 27%, whereas in Hungary it is almost 91%, Czech Republic 83%, Slovenia 78%, etc. (CIA World Factbook, 2017).

The general situation with e-business tools implementation in Croatian companies could be described as somewhat diverse and heterogeneous. Several authors focused their research efforts on various elements of ICT adoption and suggested different findings related to the scope and nature of ICT implementation. Sinjeri, Vrčec, & Bubaš, 2010 examined critical factors for successful e-services and e-government implementation at a local or national level and suggested that many critical factors can be examined within three important areas: ICT infrastructure, management issues, and human resources. The survey showed that the vast majority of Croatian cities had a good ICT infrastructure base, but other areas showed a lot of room for improvement, to put it mildly. Zovko and Didović (2013) concluded that it is not enough only to ensure the existence of the necessary ICT infrastructure, but to systematically educate all the stakeholders involved in order to decrease the existing digital divide. A comprehensive study based on the most profitable Croatian companies from different business sectors revealed that only a minority (44%) of them were implementing a high level of electronic resources and internet-based services in conducting business activities (Biloš, 2012). However, among the companies who were utilizing e-business and e-marketing activities, there was enough evidence of best-practice solutions and exemplary implementation to expect further development of ICT adoption. In the last two decades or so, the number of internet users, personal computers, laptops, and mobile devices has increased significantly while Croatian companies have invested considerable resources in technological equipment, thus significantly expanding the ICT infrastructure platform for the further development of the digital economy (Martinović, Požega, & Pudić, 2014).

Baller et al. (2016) published The Global Information Technology Report including The Networked Readiness Index (NRI) for 2016. NRI measures the performance of 139 global economies in utilizing ICT to boost competitiveness, innovation, and well-being, ultimately leveraging the benefits of emerging technologies and capitalizing on the opportunities of the digital environment. Countries in the report are assessed over four categories of 53 indicators in total (Baller, Di Battista, Dutta, & Lanvin, 2016):

- 1) The overall environment for technology use and creation (political, regulatory, business, and innovation).
- 2) Networked readiness in terms of ICT infrastructure, affordability, and skills.

- 3) Technology adoption/usage by the three groups of stakeholders (government, the private sector, and private individuals).
- 4) Economic and social impact of the new technologies.

The NRI Report puts Croatia in 54<sup>th</sup> place out of 139 analyzed economies with an average score of 4.29. A total NRI score is calculated based on four sub-scores as follows: Environment sub-index (4.10); Readiness sub-index (5.25); Usage sub-index (4.04) and Impact sub-index (3.75). Based on NRI measurements, Croatia shows moderate ICT readiness with its upper-middle position in the rank. Readiness sub-index is the best performing one for Croatia at 5.25 including three pillars – Infrastructure, Affordability, and Skills. However, the lowest score was awarded for Business usage, a pillar in Usage sub-index, which recorded 3.4, thus placing Croatia in 98<sup>th</sup> position out of 139, based solely on that metric. It is clear that there is quite a lot of room for progress in that area.

Based on the literature review, the following hypothesis was defined:

H1: Companies that have a higher level of e-business tools adoption have better export performance.

## RESEARCH METHODOLOGY

The aim of this research is to test whether there is a relation between the level of e-business tools adoption and export performance in Croatian companies. The level of e-business tools adoption was measured with several items that are extracted from the OECD e-commerce maturity model and measure ICT readiness and implementation (OECD, 1999). Additional studies were consulted and the initial research framework was adapted according to Kotnik and Hagsten (2018) as well as Ghalandari (2013). Finally, five items were selected and measured in the research:

- e-mail usage;
- Internet usage in market research;
- Internet usage in promotion;
- online ordering/sales;
- e-payment possibilities.

These items are also used for measuring market intelligence capabilities, marketing capabilities and relationship building capacities of companies, the major dimensions of functions of ICT usage, as suggested by Luccheti and Sterlacchini (2004). The export performance was measured by:

- export/total business activities ratio;
- export/total revenue ratio;

- existence of a multilingual official web site.

This study has used the Bisnode database of Croatian companies. We concentrated on the following industries: agriculture, forestry and fishing, mining and quarrying, manufacturing, and information and communication. The intention was to exclude services, especially tourism and transportation that significantly impact Croatian exports, according to the suggestion of separating exports of goods and services in the study by Bilas, Bošnjak, and Franc (2015). The Bisnode database has identified 25,423 companies from those industries that are involved in export activities, which makes up about 8% of all registered companies. Their total income of almost 275 million Euro in 2018 makes up about 29% of the total income in the given industries. Altogether, 600 exporting companies that export a minimum of 10,000 Euro value per year in the last three years were chosen from the Bisnode database for inclusion in the sample, taking into account company size, industry, and geographic scope. Research was conducted through a field survey using an e-questionnaire, which was sent to general managers of the identified companies. Respondents were assured anonymity and confidentiality. The questionnaire was available online from November 2017 to May 2018. A total of 137 questionnaires were returned and after the separation of invalid or incomplete ones, a total of 111 questionnaires were used for statistical analysis. This gave a response rate of 18.5%, which is considered acceptable in studies of this nature.

In order to test the hypothesis H1, a dependent variable measuring export performance was created (*EXP\_Per*). The variable (*EXP\_Per*) is based on the z-value of the following variables: the export/total business activities ratio, the export/total revenue ratio, and the existence of a multilingual official website. In the research hypothesis testing process, several statistical methods were used. One of the applied methods was *correlation analysis*, which indicates if there is any correlation between e-business tools adoption and the export performance of Croatian exporters. *T-test* procedure for independent samples was deployed to test the differences between the export companies that are exporting and the ones that are not exporting to specific international markets (regional, EU and non-EU or non-regional market) and the level of e-business tools implementation of Croatian exporters. The sample structure is presented in Table 1.

**Table 1.** Sample structure

Variables		n	%
Number of employees	1 – 50	45	40.5
	51 – 250	36	32.4
	More than 250	30	27.0
	Total	111	100.0
Proportion of highly educated employees	Less than 10%	34	30.6
	11 – 25%	51	45.9
	26 – 50%	16	14.4
	More than 50%	10	9.0
	Total	111	100.0
Company age (years)	1 – 10	14	12.6
	11 – 30	52	46.8
	31 – 50	14	12.6
	51 – 80	16	14.4
	More than 80	15	13.5
	Total	111	100.0
Share of foreign ownership	0%	78	75.7
	0.1% – 10%	2	1.9
	10.1% – 25%	2	1.9
	25.1% – 49.9%	2	1.9
	More than 50%	19	18.4
	Total	103	100.0
Industry	Manufacture of wood and furniture	12	11.3
	Construction	12	11.3
	Manufacture of wearing apparel	10	9.4
	Agriculture and food	19	17.9
	Metal industry and mechanical engineering	10	9.4
	Information technology	7	6.6
	Chemical and pharmaceutical industry	13	12.3
	Manufacture of rubber and plastic products	2	1.9
	Manufacture of electrical equipment and machinery	6	5.7
	Trade	9	8.5
	Manufacture of paper and paper products	6	5.7
	Total	106	100.0

## RESEARCH RESULTS AND DISCUSSION

The first part of the research was aimed at recognizing the export performance characteristics of Croatian exporters. These are presented in Table 2.

**Table 2.** Export performance characteristics

Variables		n	%
Exports/total business	Less than 10%	18	16.4
	11 – 25%	15	13.6
	26 – 50%	17	15.5
	51 – 75%	28	25.5
	More than 75%	33	29.1
Total		111	100.0
Export/total revenue	Less than 10%	17	16.5
	11 – 25%	15	14.6
	26 – 50%	22	21.4
	More than 50%	49	47.6
	Total	103	100.0

**Table 3.** Existence of multilingual official website

Company official website	Responses		Percent of cases
	n	%	
English	84	58.7	83.2
German	31	21.7	30.7
Italian	5	3.5	5.0
French	3	2.1	3.0
Other language	6	4.2	5.9
Croatian only	14	9.8	13.9
Total	143	100.0	141.6

Although there are not many exporting companies in Croatia (15% of all registered companies), those that engage in export activities are strongly export-oriented: for 54.6% (61 companies) of our respondents, exports make up 50% or more of their total business activities. This is in accordance with GEM research findings (Singer et al., 2017) that show a relatively high level of internationalization of Croatian companies: 37% of respondents have more than 25% as international customers. Accordingly, for 49 companies (47.6%), export revenues make up over 50% of their total revenue. Furthermore, almost 84% of examined companies have multilingual websites aimed at

international markets with English (81.1%) and German (28.8%) being the most popular language variants.

Regarding e-business tools and their adoption, the research results are presented in Table 4.

**Table 4.** E-business tools adoption by Croatian exporters

Items		Never	Rarely	Often	Permanently	Total
E-mail for correspondence with partners/suppliers/buyers	n	0	0	8	103	111
	%	0.0	0.0	7.2	92.8	100.0
Internet as an information source on foreign markets/buyers/suppliers	n	0	3	34	72	109
	%	0.0	2.8	31.2	66.1	100.0
Internet as a promotional tool for foreign markets	n	9	34	35	32	110
	%	8.2	30.9	31.8	29.1	100.0
Online ordering/sales	n	38	33	23	16	110
	%	34.5	30.0	20.9	14.5	100.0
E-payment	n	13	11	24	63	111
	%	11.7	9.9	21.6	56.8	100.0

Research findings show that Croatian exporters rely on various e-business tools in conducting business activities. It comes as no surprise that Croatian exporters utilize e-mail as a dominant communication channel: over 90% of the examined companies use e-mail constantly while an additional 7.2% use it often, which makes up over 99% of companies using e-mail as a major tool for international correspondence. About two thirds (66.1%) of companies constantly rely on the internet as an information source about international markets, customers and suppliers while an additional 31% report using it often. The internet is significantly used for digital payments; 88.3% of respondents utilize e-payments to some extent. The majority of respondents (56.8%) use it constantly and an additional 21.6% often. Usage patterns are somewhat different regarding internet promotion and online ordering/sales. Even though 91% of respondents report utilizing an internet platform for promotional purposes, over 30% use it rarely and about the same percentage use it often (31.8%) and constantly (29.1%). In addition, over a third (34.5%) of respondents do not provide an online ordering/sales platform, and 30% use one rarely.

It is clear that Croatian exporters are digitally present on the global market and rely on e-business tools in terms of multilingual variants of official websites, using the internet as an information source and communication channel. Besides, Croatian exporters exhibited a tendency to use e-payments

in their business activities. However, according to the findings of this research, the adoption of internet promotion and online ordering/sales is detectable but rather limited.

The e-business variables described in Table 4 are measured on an ordinal measurement scale. In order to test the research hypothesis, new e-business variables were calculated with the following recoding of categories: never = 0, rarely = 1, often = 2, permanently = 3. This recoding procedure resulted in five new variables that are finally aggregated in one variable: e-business tools\_sum, where the higher results indicate a higher implementation of e-business tools in export companies.

**Table 5.** Correlation analysis (Spearman's rho)

		(1) EXP_Per	(2)	(3)	(4)	(5)	(6)
(1) Export performance (EXP_Per)	Correlation Coefficient	1.000					
	p	.					
	n	111					
(2) E-mail for correspondence with partners/suppliers/buyers	Correlation Coefficient	.206*	1.000				
	p	.030	.				
	n	111	111				
(3) Internet as an information source on foreign markets/buyers/suppliers	Correlation Coefficient	.027	.399**	1.000			
	p	.782	.000	.			
	n	109	109	109			
(4) Internet as a promotional tool for foreign markets	Correlation Coefficient	.244*	.037	.365**	1.000		
	p	.010	.698	.000	.		
	n	110	110	108	110		
(5) Online ordering/sales	Correlation Coefficient	.139	.054	.214*	.328**	1.000	
	p	.147	.575	.026	.001	.	
	n	110	110	108	109	110	
(6) E-payment	Correlation Coefficient	.262**	.179	.229*	.107	.365**	1.000
	p	.006	.060	.017	.266	.000	.
	n	111	111	109	110	110	111

**Note:** \*. Correlation is significant at the 0.05 level (2-tailed); \*\*. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis indicates that e-business tools adoption has a positive correlation to the export performance of Croatian exporters. However, it should be noted (as can be seen in Table 5) that three e-business tools adoption factors positively correlate with export performance: namely (1) e-mail use for correspondence with partners/suppliers/buyers, (2) use of the internet as a promotional tool for foreign markets and (3) e-payment use.

Two remaining e-business tools adoption factors that were measured – (1) use of the internet as an information source on foreign markets/buyers/suppliers and (2) online ordering/sales, did not record a significant correlation with export performance. The use of the internet as an information source could be a general practice that doesn't directly influence export performance even though it should enable a better understanding of a foreign market. Also, it was apparent from the results that respondents do not rely on online ordering/sales as much as was expected and this might be the reason behind the missing correlation.

The new e-business tools adoption variable was used to test differences between export companies that are exporting or not exporting to specific international markets (regional, EU and non-EU or non-regional market)

**Table 6.** Independent sample t-test for the e-business tools\_sum variable and presence in the international market

	Presence in the international market		n	Mean	Std. Deviation	Std. Error Mean	Test statistics
e-business tools_sum	Regional market	Yes	72	11.31	2.761	.325	p > 0.05
		No	31	10.97	2.961	.532	
e-business tools_sum	EU market	Yes	91	11.34	2.806	.294	p > 0.05
		No	12	10.17	2.758	.796	
e-business tools_sum	Non-EU market, non-regional market	Yes	63	11.80	2.766	.348	t=2.756, df=101, p <0.01
		No	40	10.28	2.660	.421	

Table 6 shows statistically significant differences between companies that are present at non-EU and non-regional markets. The analysis of the results indicates that the e-business tools implementation of Croatian exporters does not differ in the case of companies' presence in regional ( $p > 0.05$ ) and EU markets ( $p > 0.05$ ), which can be identified as geographically and culturally close, but companies that are present in the non-EU and non-regional markets have a statistically higher level of e-business tools implementation ( $p < 0.01$ ). It shows that non-regional and non-EU markets, i.e. geographically and culturally distant markets, require a higher level of e-business tools implementation by Croatian exporters. It is a significant indication since 56% of respondents do business in those markets.

Several similarities can be observed in comparison with other studies of similar scope. Generally speaking, e-business is adopted internationally and is usually linked with improving company performance. Similar trends are found in studies related to European companies (Eikebrokk, & Olsen, 2007), and SMEs in particular (Depaoli & Za, 2013; Daniel, Wilson & Myers, 2002). Galandhari (2013) concluded that ICT has a significant effect on export performance

of Iranian companies, but this effect was depending on the way of using ICT (different dimensions of ICT use). Makanyeza and Ndlovu (2015) obtained similar findings on Zimbabwean exporters; ICT's influence on export performance was "dimension-specific" and only one dimension was linked to export performance.

In contrast to our research, company size played an important role in ICT adoption's effect on the export performance of Costa Rican exporters (Mata & Quesada, 2015). As Kotnik and Hagsten (2018) suggested, there is a noticeable heterogeneity of e-business tools' effect on export performance among different EU countries; in some of them, e-commerce is positively associated with the predicted export performance and in others, e-business tools usage does not appear to be of importance for export performance. The latter leads to the possible conclusion that even the country, i.e. external environment characteristics, can influence export performance.

## CONCLUSION

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The aim of this study was to contribute to the recent studies on significant factors that determine the export performance of a transitional economy in Central and Eastern Europe. The research concentrated on the issue of e-business tools usage and its, presumably positive, impact on the export performance of Croatian exporting companies. The intention was to provide a deeper understanding of its impact. As was shown in the theoretical background, many authors and studies focused on the importance of ICT and e-business tools implementation in improving overall business performance and particularly in export activities. Furthermore, several studies have confirmed a more or less strong positive correlation between the level of e-business tools adoption and export performance (Beckers et al., 2007; Mathews & Bianchi, 2010; Ghalandary, 2013 and others). A similar conclusion can be drawn from our research. In line with the expected research outcomes, our findings provide enough evidence that e-business tools adoption has a positive correlation to the export performance of Croatian exporters. However, it should be noted (as can be seen in Table 5) that three e-business tools adoption factors positively correlate with export performance: namely (1) e-mail use for correspondence with partners/suppliers/buyers, (2) use of the internet as a promotional tool for foreign markets and (3) e-payment use. Two remaining e-business tools adoption factors that were measured – (1) use of the internet as an information source on foreign markets/buyers/suppliers and (2) online ordering/sales, did not record a significant, i.e. positive correlation, with export performance. With regard to international market geographical orientation, we found significant differences in

exporting companies oriented toward geographically and culturally distant markets (non-regional and non-EU markets) that have a statistically higher level of e-business tools implementation in comparison to those exporting dominantly to regional and EU markets. This illustrates the significance of e-business tools adoption for reaching and managing those distant markets that are important for a number of Croatian exporters.

This study is not without limitations. The major one is the sample size and a structure that is not fully representative of Croatian exporters, especially regarding its geographical distribution. Therefore, the obtained results can only be taken as indicative. The second one is the simplification of the export performance measure, which takes into account only three variables, whereas numerous studies rely on many more, including managers' subjective satisfaction with export results. Regarding the limitations of the present study, future research on the topic should aim at constructing a more complex export performance measurement instrument, and the provision of a more representative sample. It could also be interesting to analyze the company characteristics (size, industry, ICT knowledge, organizational culture) in relation to e-business tools adoption. Moreover, the study could be expanded in order to test the perceptions of e-business tools' contributions to different aspects of value creation in export performance (financial, strategic and personal satisfaction).

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### **Abstrakt**

Rozwój technologii umożliwił firmom wszelkiego rodzaju, branży i wielkości aktywne uczestnictwo w międzynarodowym biznesie. Technologie informacyjno-komunikacyjne (ICT), a zwłaszcza narzędzia e-biznesu, są ważne dla międzynarodowej działalności przedsiębiorstw. Technologie informacyjno-komunikacyjne zwiększają potencjał firmy do znacznego przyczynienia się do wzrostu gospodarczego, ponieważ odgrywają istotną rolę w upraszczaniu procesów biznesowych i przyczyniają się do poprawy konkurencyjnej obecności firmy na rynku. Celem tych badań jest określenie poziomu wdrożenia narzędzi e-biznesu w chorwackich firmach eksportujących i zbadanie ich wpływu na wyniki eksportowe. W analizie poziomu wdrożenia narzędzi do e-biznesu zastosowano model OECD, częściowej dojrzałości e-commerce, który mierzy kilka aspektów gotowości ICT i intensywności stron internetowych i e-commerce w firmach eksportujących. Zbadano kilka różnych aspektów wdrażania narzędzi do e-biznesu, a mianowicie korzystanie z poczty elektronicznej, korzystanie z Internetu w badaniach rynku, promocję, handel elektroniczny i możliwości płatności elektronicznych. Poziom wydajności eksportowej mierzono za pomocą trzech elementów: wskaźnika eksportu / całkowitej aktywności biznesowej, wskaźnika eksportu / całkowitego dochodu oraz, dodatkowo, istnienia wielojęzycznych, oficjalnych stron internetowych. Nasze ustalenia dostarczają wystarczających dowodów na to, że przyjęcie narzędzi e-biznesowych ma pozytywną korelację z wynikami eksportowymi chorwackich eksporterów. Należy jednak zauważyć, że trzy czynniki związane z przyjęciem narzędzi e-biznesowych pozytywnie korelują z wynikami eksportowymi: a mianowicie (1) korzystanie z poczty elektronicznej do korespondencji z partnerami / dostawcami / nabywcami, (2) korzystanie z Internetu jako narzędzia promocyjnego dla zagranicznych rynków i (3) korzystanie z płatności elektronicznych. Dwa pozostałe czynniki przyjęcia narzędzi e-biznesowych, które zostały zmierzone to (1) wykorzystanie Internetu jako źródła informacji o rynkach zagranicznych / kupujących / dostawcach oraz (2) zamówienia online / sprzedaż online, nie odnotowały istotnej korelacji z wynikami eksportowymi. Ustalenia te sugerują, że wciąż jest miejsce na lepsze wdrażanie narzędzi e-biznesu w chorwackich firmach eksportujących, szczególnie w zakresie badań rynku oraz zamówień online i sprzedaży, które mogą przyczynić się do lepszych wyników eksportowych. Jeśli chodzi o orientację geograficzną rynku międzynarodowego, stwierdziliśmy znaczne różnice w firmach eksportujących zorientowanych na rynki odległe geograficznie i kulturowo (rynki nieregionalne i poza UE), które mają statystycznie wyższy poziom wdrażania narzędzi e-biznesowych w porównaniu z fir-

*mami eksportującymi głównie na rynki regionalne i rynki UE. Pokazuje to znaczenie przyjęcia narzędzi e-biznesu dla dotarcia do odległych rynków, które są ważne dla wielu chorwackich eksporterów i zarządzania nimi.*

**Słowa kluczowe:** narzędzia e-biznesu, wyniki eksportowe, analiza statystyczna, eksporterzy chorwaccy, Chorwacja

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# Diversification of innovation strategies of Polish industrial processing enterprises depending on their size after the global financial crisis

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## Abstract

*The purpose of this article is to define an innovation strategy for Polish industrial processing enterprises for 2012–2014, i.e. after a negative external shock which escalated in 2008–2010 and was associated with a global financial crisis. Various types of enterprises (small, medium, large), geographic scope of markets, forms of innovation activity of enterprises, decisions by enterprises regarding innovation implementation types, methods of product development and process innovations by enterprises, and forms of eco-innovation which are the most frequent in industrial processing, were studied as well as barriers to innovation. Overall, seven detailed research hypotheses were statistically verified using a chi-square test for independence. Subsequently, due to a high number of variables taken into account in the study as well as the necessity of providing a detailed description of the relationships between them, a correspondence analysis was employed. The analysis was aimed at reducing the multi-dimensional space where the studied phenomena occur to a space of fewer dimensions, in this case, to two dimensions. This allows for a careful examination of the co-occurrence of the phenomena using biplots. A relatively slight tendency of enterprises towards innovation was established as well as caution in its implementation, which may result from the relative persistence of the exogenous shock effects. At the same time, there is a clear tendency towards eco-innovation in a broader perspective, with a slow decrease – as presumed by enterprises – in the importance of barriers to innovation. Practical conclusions following from the study show the need to emphasize the benefits of innovation, especially eco-innovation, in pro-innovation policy, which will help to avoid the adverse effects of the external shock – psychological barriers and*

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*excessive caution in innovation planning and implementation. The article presents an original, unique, and comprehensive analysis of the relationships between sixty-three variables describing the innovation activity of enterprises. Therefore, the value of the article lies in an original and strictly empirical approach to the problems of innovation in the industrial processing sector, which means that the study presented in it might become a possible model for such analyses in the future.*

**Keywords:** *industrial processing enterprises, innovation strategy, barriers to innovation, eco-innovations, correspondence analysis*

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## INTRODUCTION

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The issue of diversity in the innovation strategy of Polish enterprises in industrial processing is a complex economic problem due to a number of factors to be considered in the study. This article extensively researches the problem, including the relationships between and co-occurrence of sixty-three variables. Statistical data were from 2012–2014, thus after the exogenous innovation shock which was a result of the global financial crisis. The period under consideration is particularly interesting due to prevailing innovation pessimism as well as corporate efforts to overcome it.

In the research part of the article, the relationships between the variables and their co-occurrence are analyzed. The main determinant of innovation activity of firms proved to be their type, i.e. divided into small, medium-sized and large enterprises. That was to be expected since the typology mentioned hinges upon the number of employees, annual turnover and/or annual balance sheet total, which means the supply of enterprises with factors of production (labor and capital). The higher availability of production factors leads to greater chances for innovation because market competition forces their implementation. The dependencies were tested between the enterprise type and such variables as the geographic scope of the market in which it operates, the forms of innovation activity, types of innovation implemented, methods of developing products and process innovations, barriers to innovation, as well as the benefits of eco-innovation for the environment obtained both while producing goods or providing services and through the use of a purchased product or service by end users. Only the variables pertaining to forms of innovation activity had no confirmed dependencies, which is natural since only innovative firms were studied. However, in this case, the data also shed light on the diversity in innovation strategy of an enterprise depending on its size. Another issue to study was the co-occurrence of variables describing the innovation activity of firms, barriers to innovation and types of enterprises. It allowed multiple surprising relationships between the variables to be discovered, with some confirming

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the conclusions arrived at earlier and some disproving them. Statistical data analysis was performed using Statistica 13.3 software.

Based on empirical and theoretical studies, a research gap has been identified, consisting in insufficient identification of factors determining innovation strategies of Polish industrial processing enterprises after the global financial crisis. This concerns, in particular, investigation of the reasons behind an overall reluctance to innovate, the importance of barriers to innovation and identifying new ideas of enterprises towards innovations in the present conditions. The primary added value consists in presenting the complexity of the problem and multi-level relations between the examined variables, explaining the low willingness of enterprises to invest, discovering the relatively low importance of barriers to innovation and the emergence of a new strategy oriented towards eco-innovations.

## LITERATURE REVIEW

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The dependency between the innovation activity of companies and changes in the economic situation is relatively strong, yet inconclusive (Kijek, 2018). As claimed in the literature on the subject, the global financial crisis proved that the innovative Polish companies discussed here turned out to be not very resistant to negative external shocks. From the perspective of susceptibility of companies to changes in the economic situation, one needs to single out two time periods: the global financial crisis of 2008–2010 and the gradual economic recovery of 2010–2012. In the first time period, firms rarely used innovation resources, which led to a sudden decrease in innovation commercialization indicators – that is why it is dubbed an innovation crisis. In the second time period, the decrease in innovation commercialization rates was smaller, but at the same time, a reduction in the frequency of use of innovation resources by firms was noted, which indicated a sense of uncertainty and pessimism regarding further possibilities of the growth of markets for innovative products. Thus, the years 2010–2012 are called a period of innovation pessimism (Wziątek-Kubiak & Pęczkowski, 2019). The innovation activity of foreign companies was subject to similar changes.

Considering the innovation strategies of companies during the economic crisis, one may encounter the view that maintaining persistent innovation activity in the studied period may considerably help it to increase the survivability of an enterprise and its competitive capacity in the last stages of an economic slowdown. In addition, increased frequency of the use of innovation resources in times of crisis can alleviate its effects and shorten an innovation pessimism period. Certain consistency across innovation

strategies, before and in a crisis, increases the resistance of companies to external shocks and reduces the likelihood of disturbances in the path of innovation during a downturn. The major role of good relations between the management and trade unions is also highlighted as well as of labor relations in improving the company's survivability of a crisis (Antonioli et al., 2013). The persistence of innovation in times of crisis may be sustained through both public support for enterprises and their own innovation strategies. In Italy, for instance, one may observe limitation of the said persistence primarily to process innovation (Antonioli & Montresor, 2018).

The issue of innovation in enterprises plays a central role in the European Union's development plans. The basic priorities of the Europe 2020 Strategy include smart growth, sustainable growth, and inclusive growth. The first of these concerns the development of a knowledge- and innovation-based economy, increasing the potential of the digital economy caused by higher investment expenditures for research and development, and improvement of the educational quality (Gasz, 2014). This requires allocating 3% of the European Union GDP for development and growth investments (*Europe 2020: A European strategy...*, 2010). It can be observed that the Gross Domestic Expenditure on the R&D indicator (GERD) and its dynamics have varied significantly in individual EU countries in recent years. In 2010–2016, its highest values, fluctuating around the threshold determined by the Europe 2020 Strategy, were recorded in Sweden, Finland, Denmark, Germany, and Austria. In Poland, this indicator demonstrated a growing trend, changing from 0.56 in 2007 to 1.03 in 2017. In 2017, GERD for the entire European Union was 2.07%, which indicated a rather low probability of reaching the target value of 3% in 2020 (Eurostat, 2019). However, it turns out that failing to meet this condition does not impede the innovation capability of enterprises too much, as with the development of digitalization the number of patents granted by the European Patent Office has increased throughout the entire European Union (MacGregor Pelikánová, 2019).

The issues of innovation, economic growth and development, and welfare are closely related to entrepreneurship (*Raport z badania...*, 2018). It appears that innovative entrepreneurs, measured by the level of innovation in the initial phase of their entrepreneurial activity (TEA – Total Early-stage Entrepreneurial Activity), are the most numerous in the European countries with the highest rates of economic growth and higher levels of real national income. However, the research also indicates the absence of a close relationship between a higher degree of entrepreneurial activity, consisting in the establishment of new companies, and economic development, which may result from the varied motivations of entrepreneurs in individual EU countries. It is assumed that entrepreneurs of the Schumpeter type, i.e. innovators applying creative

destruction, are prevalent in developed countries, which naturally contributes to economic growth, while less innovative shopkeepers are the most common in developing countries (Crudu, 2019; Block, Fisch, & van Praag, 2017).

Studies of the Norwegian economy demonstrated that from the perspective of the innovation of enterprises, their endowment with a set of unique resources or assets and the ability to operate in an innovation-friendly socio-economic environment are of critical importance. It appears that factors affecting the probability of undertaking innovation included four attributes related to the enterprise and two attributes of a regional nature. The most important characteristics concerning the enterprises included their size, industrial sector, availability of R&D staff, and own-financed research and development work, while the environmental features were related to the size and the quality of the region. The most important factor affecting the probability of innovation proved to be the size of the enterprise. Larger enterprises turned out to be more innovative than the smaller ones. This observation is consistent with basic economics, as sizeable enterprises can allocate much larger resources or assets to their innovative activity than smaller enterprises. With regard to the business sector, it was found that although the probability of innovation was similar in all industry sectors, it proved to be significantly lower in commercial and transport sectors. The availability of research and development personnel increases the probability of innovation, but this effect is not significantly higher in comparison to enterprises that do not have such staff. On the other hand, internal financing of research and development works demonstrated a great positive effect on enterprises undertaking innovation (Lorentzen & Jakobsen, 2016).

The size of the enterprise is one of the most important internal properties, indicating its ability to undertake innovation. This feature is usually defined based on the Cobb–Douglas production function, which contains such independent variables as labor input and capital input (Cobb & Douglas, 1928). This approach has been assumed in the European Union, where the classification of enterprises into small, medium and large enterprises is based on employment limits and the value of annual turnover and/or annual balance sheet total (Commission Regulation (EU) No. 651/2014). The best variable describing innovation capability of enterprises would be the value of innovation capital, but this notion is not clearly defined in the literature. This emerged from the combination of two economic terms: capital, in the meaning of the factor of production, and innovation. Generally speaking, innovation capital covers a bundle of the firm's resources or assets, which provides complementary services in the process of creating and commercializing new knowledge. It also contains elements necessary in the processes of developing new products or services, such as science, culture, technology, and networks of cooperation

(Kijek, 2012). In this approach, examination of an innovation strategy of enterprises equals examination of their innovation capital.

The caution of Polish enterprises in undertaking innovation activity may result from mutual distrust which impedes cooperation between firms. It can be observed that significant disproportions exist in Poland with regard to innovation of enterprises in the regional perspective, with the largest of them concerning the share of sold production of new or substantively improved (modernized) goods in the sold value of industry. Additionally, the research discovered the occurrence of unsatisfactory cooperation between enterprises in the area of innovation. This suggests the existence of distrust between firms as regards innovation activity, which may result in the lack of mutual benefits from the implementation of innovations (Golejewska, 2018). Similar conclusions can be derived from the Norwegian experience. A very important factor increasing the probability of innovation in enterprises is the socio-economic environment supporting innovative activity. Here, the size and the quality of the region where the enterprise is situated play an important role. In Norway, the highest innovation activity is demonstrated by enterprises located in the capital region, with the highest number of inhabitants and variety of institutions, while the lowest activity characterizes enterprises located in rural areas, in regions with a population below 10,000. The quality of the region, reflected in the existence or lack of existence of regional network of cooperation between enterprises, is also of high significance. Regional cooperation between enterprises in the area of innovation significantly increases the probability of undertaking innovations by enterprises. Innovation indicators are higher for those enterprises that are involved in regional cooperation, compared to those that do not cooperate with others (Lorentzen & Jakobsen, 2016). The quality of the human and organizational environment is also important for the diffusion of innovation, understood as spreading information on innovative products or technologies by external communication channels, among both purchasers and entrepreneurs (Baran, 2010).

Research into enterprise innovation strategies proves that at least five types of such strategies can be named: (1) a science-based strategy, (2) an investment-based strategy, (3) an IT/process-oriented strategy, (4) a process/product-oriented strategy and (5) an IT/product-oriented strategy. The enterprises following a strategy of the first or last type are high-profile innovators; if they focus on investments (2) and/or a process or product (4), they are low-profile innovators; whereas enterprises following an IT/process-oriented strategy (3) represent medium-profile innovators. A substantial number of firms are able to modify their strategies already in a three-year time frame. The socio-economic environment affecting the innovation activity

of enterprises, including such elements as demand prospects, intensity of competition, and technological opportunities, change quickly and companies ought to be capable of adapting to them via strategy changes. Firms following strategies (1), (3), and (5), i.e. based on science, oriented to IT/process and IT/product, achieve the greatest benefits from strategy changes – that is why they are referred to as net winners. On the other hand, companies following the least innovative strategy (4), i.e. a process/product-oriented one, tend to be net losers after a strategy change. Such patterns of innovation strategies of companies rely on structural changes occurring in highly-developed economies, e.g. in Switzerland (Hollenstein, 2018, 2019).

Comparative studies among companies in such countries as Poland, the Czech Republic, and Hungary rendered it possible to distinguish five various innovation strategy patterns: low profile pattern firms, virtual firms, spillover absorbers in process innovation, firms on the science-based innovation path and firms pursuing supplier orientation. This typology was based on companies operating in four manufacturing industries: food and beverages, automotive, pharmaceuticals and electronics. Each of these strategies involves various forms of innovation activity and different innovation outputs (Balcerowicz, Pęczkowski, & Wziętek-Kubiak, 2012; Wziętek-Kubiak, Balcerowicz, & Pęczkowski, 2013). These patterns of innovation are also widespread in other EU Member States, which indicates that countries themselves may exert a limited impact on the heterogeneity of the innovation dynamics of companies (Srholec & Verspagen, 2008).

Undertaking eco-innovation currently appears to be a separate innovation strategy of Polish enterprises, whose aim is to reach sustainable economic development as a result of reducing the negative effect of industrial production on the environment and responsible use of natural resources. Their importance in economic life has been continuously growing and in the future, they might be a key factor in business competitiveness. Eco-innovation involves the introduction of new environmentally-friendly production processes and technologies, which is intended to prevent environment degradation and reduce biodiversity. The environmental benefits of such an innovation strategy can occur either during the generation of a product or service, or through the use of a purchased product or service by end users. In Poland, between 2010 and 2012, the eco-innovation activity of industrial enterprises was insignificant, which led to its classification into countries catching up in this regard (Gałązka, 2017; Węgrzyn, 2013). This should not be surprising as that was a period of innovation pessimism. However, the study described in this article implies that Polish industrial companies are becoming increasingly interested in eco-innovation.

## RESEARCH METHODS

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Two statistical methods were employed in the study: Pearson's chi-square test for independence and correspondence analysis. A chi-square test for independence is used in analyses of the relationship between two nominal variables. The chi-square statistic is used to establish a test value. The test is carried out by comparing empirical values actually achieved and expected values calculated with the assumption of no relationship between the variables (null hypothesis). If the difference between these values is statistically significant, a relationship between the variables is assumed (Pearson, 1900). The hypotheses tested concerned relations between the variables defining the types of enterprises and their innovation activity, as per the contingency tables. A correspondence analysis is a descriptive and exploratory method of analyzing two-way and multi-way tables that contain metrics describing the correspondence between the rows and columns (Bourdieu, 1996) and allows the co-occurrence of phenomena to be studied. It is intended to reconstruct the distances between points representing rows and columns of two-way and multi-way tables in a space with a fewer number of dimensions, usually in a two-dimensional space. Calculations are performed in a way that maintains as much information as possible about the diversity of rows and columns. The result of applying this method is a graphical representation of the structure of relationships between the variables included in the tables (Benzécri, 1992; Greenacre, 1984).

The popularity of correspondence analysis in economic research is on the rise, although it seems reasonable to briefly present what underlies it. The first step in correspondence analysis is the construction of a correspondence matrix. It consists of relative frequencies, achieved by dividing entries in a multi-way table by their grand total. A row profile matrix can then be calculated, achieved by dividing relative frequencies in each row of the correspondence matrix by the sum of all frequencies in the corresponding row. A column profile matrix is calculated in a similar way; it is an effect of dividing each relative frequency in a given column by the sum of frequencies corresponding to the said column. The next step is determination of average profiles. An average row profile is arrived at by dividing the summary row of a multi-way table by the grand total. It is a sum of all the relative frequencies in the columns of a correspondence matrix. An average column profile is calculated by dividing the summary column in a multi-way table by the grand total. It is also produced by a sum of the relative frequencies in the rows of a correspondence matrix.

In correspondence analysis, the chi-square metric is used to calculate the distances between row profiles and column profiles. Inertia, associated with

this metric, is an equivalent of variance – which is well-known in statistics. Total inertia shall be understood as a measure of the dispersion of row or column profiles around their average profiles. Inertia calculated for rows is equal to the inertia calculated for columns. To reduce the dimension of the phenomenon tested, which – as mentioned – is the principal goal of correspondence analysis, the method of singular value decomposition of the correspondence matrix is employed (Borg & Groenen, 2010; Greenacre, 2007). Total inertia is constituted by the sum of the squares of eigenvalues. The percentage measure is used to select the number of dimensions, which is the quotient of the sum of squares of the first two eigenvalues, after ordering them in a non-growing manner, and the total value of the chi-square statistic. If this ratio equals at least 75%, it is recognized that a two-dimensional space adequately reflects the initial values. Having selected the recommended number of dimensions, the coordinates of row and column profiles are calculated in a new coordinate system. This provides a graph – a biplot – presenting a set of points that reflects the relationships between the rows and columns (Greenacre, 2010). In this article, row and column profile standardization was applied for interpretation of results. It allows the coordinates for rows and columns to be determined in the same coordinate system. It is then possible to simultaneously analyze points representing row profiles and column profiles. Thus, the row coordinates were calculated based on the row profile matrix and the column coordinates were then calculated on the basis of the column profile matrix.

The concepts of the quality of a point as well as of a row or column masses also need to be explained. Row mass is the total of the relative frequencies in a given row, and column mass is the total of the relative frequencies in a given column. One can also say that row mass is an average column profile, and that column mass is an average row profile. The row or column masses provide information about the importance of a given row or column. On the other hand, relative frequencies define how one unit of mass is distributed across the cells of the table. Quality is about reflecting a row or column in a selected coordinate system. With regard to the chi-square metric, the quality of a point shall be understood as a quotient of the square of the distance between the selected point and the origin of coordinate system adopted and the square of the same distance in a coordinate system with the maximum number of dimensions. Although the quality of a point may range from zero to one, the higher this measure is, the better the representation of a given row or column in a space with an agreed number of dimensions.

## DATA ANALYSIS AND STUDY RESULTS

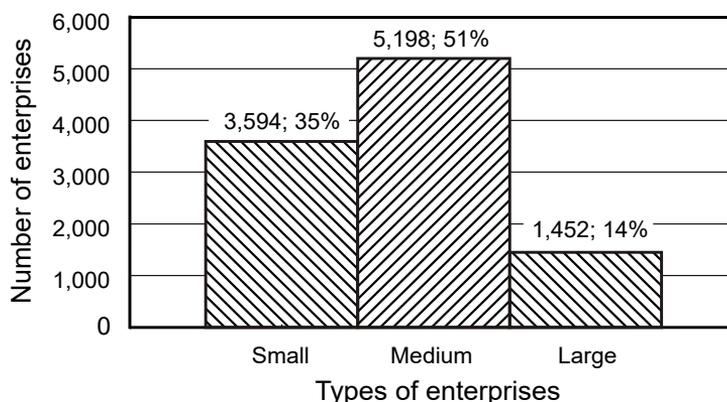
### General characteristics of the companies studied

Available data concern 10,244 Polish innovative enterprises in the industrial processing sector, divided into three types: small, medium and large. According to Article 2 (Annex I) of Commission Regulation (EU) No. 651/2014, a small enterprise means an economic operator employing fewer than 50 persons whose annual turnover and/or annual balance sheet total does not exceed EUR 10 million. Medium-sized enterprises are those that employ fewer than 250 persons and their annual turnover does not exceed EUR 50 million, and/or their annual balance sheet total does not exceed EUR 43 million. If the business entity exceeds the limits set for the medium-sized enterprise, it is called a large enterprise. The analyzed database does not include micro-enterprises which, according to their definition, employ less than 10 persons and whose annual turnover and/or annual balance sheet total does not exceed EUR 2 million. This is consistent with the logic of the production function since with low resources of production factors it is difficult to carry out innovative activity. Table 1 illustrates all three types of enterprises studied and their numbers.

**Table 1.** Types of enterprises, their numbers, and variable codes

Types of enterprise		
Name	Code	Number
Small (up to 49 employees)	FR_1	3,594
Medium-sized (between 50 and 249 employees)	FR_2	5,198
Large (250 or more employees)	FR_3	1,452
Total		10,244

The distribution of the companies by type is shown on a histogram in Figure 1. Medium-sized enterprises account for 51% of the companies studied, small – 35%, and large – 14%. Further research showed that the type of company is of utmost importance from the standpoint of its innovation activity.



**Figure 1.** Histogram presenting the companies by number and type (small, medium-sized, large)

### The scope of the geographic market of the companies studied

A market is to be understood as an economic institution consisting of a series of mechanisms that allow for establishing contact between producers and consumers in order to enable the exchange of different types of goods, services, and information. Economic institutions define the rules of the game in the society by introducing certain restrictions on interactions among people (North, 1990, p. 3). They are essentially focused on the development of markets, for they include sets of rules, enforcement mechanisms, as well as organizations supporting market transactions (*Building Institutions...*, 2002, p. 4). This study involved the division of the market according to its geographic scope and the following market types were singled out: local, domestic, EU, and non-EU markets. Table 2 reveals the number of individual enterprise types by market.

**Table 2.** Types of enterprises and the geographical scope of their markets

Types of enterprise	Code	The scope of the geographic market (name and code)			
		Local – RK1	Domestic – RK2	EU Member States – RK3	Non-EU countries – RK4
Small	FR_1	2,953	2,653	1,789	777
Medium-sized	FR_2	4,261	4,330	3,854	2,331
Large	FR_3	1,196	1,284	1,314	1,052

There was a research question posed about the existence of a relationship between the type of enterprise and the geographic scope of the market in which a given firm operates. To verify this, a chi-square test for independence is performed. The following research hypotheses were formulated:

$H_0$ : market geographic coverage does not depend on the type of enterprise;  
 $H_1$ : market geographic coverage depends on the type of enterprise.

Verification results of the null hypothesis are presented in Table 3. One may observe that with a significance level  $\alpha = 0.05$ , the inequality  $p < \alpha$  is preserved, thus the null hypothesis has to be rejected. It must be concluded that market geographic coverage depends on the enterprise type.

**Table 3.** Results of the verification of the  $H_0$  hypothesis regarding the independence of market geographic coverage from an enterprise type

$\chi^2$ value	Degrees of freedom	Significance level ( $\alpha$ )	$p$ -value
1,186.464	2	0.05	0.000
Decision	Since $p < \alpha$ , $H_0$ needs to be rejected in favor of $H_1$		

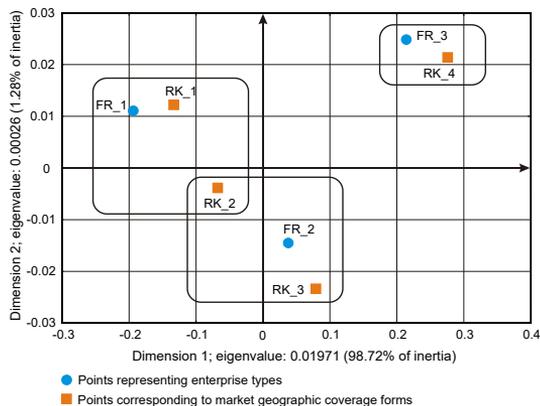
A more thorough analysis of relationships between market geographic coverage and enterprise types requires a correspondence analysis. Table 4 presents the coordinates of points representing the types of enterprises (rows) and the market geographic coverage (columns) as well as the statistics of the quality of the solution. The evaluation of the quality of mapping of the points representing the rows and columns is provided in the last column of Table 4. Point quality is the measure of representation of individual rows (columns) in a space with fewer dimensions. It ranges from 0 to 1. The closer to one, the better the point analyzed is represented. Here, the quality of mapping of the individual rows and columns is excellent since the measure reached its maximum – 1. This only happens when two dimensions explain 100% of the total inertia.

**Table 4.** Coordinates of rows (enterprise types) and columns (market geographic coverage) as well as the statistics of the solution quality

Row coordinates				
Row	Dimension		Mass	Quality
	Axis 1	Axis 2		
FR_1	-0.193975	0.011217	0.294020	1.000000
FR_2	0.037472	0.014391	0.531626	1.000000

Row coordinates				
Row	Dimension		Mass	Quality
	Axis 1	Axis 2		
FR_3	0.212853	0.024963	0.174354	1.000000
Column coordinates				
Column	Dimension		Mass	Quality
	Axis 1	Axis 2		
RK_1	-0.134306	0.012351	0.302583	1.000000
RK_2	-0.068122	-0.003784	0.297438	1.000000
RK_3	0.078923	0.023306	0.250306	1.000000
RK_4	0.274906	0.021526	0.149673	1.000000

The precise relationships between enterprise type and market geographic coverage may be illustrated in a two-dimensional space. Graphic interpretation of these dependencies is presented in Figure 2. The relevant instances of co-occurrence of the phenomena were marked with square frames. Small enterprises (FR\_1) operate mainly in local and domestic markets, medium-sized enterprises (FR\_2) sell their products on domestic and EU markets, and large enterprises (FR\_3) cater to virtually all the market types. In the latter case, however, non-EU markets stand out. An insufficient interest of companies in the vast Community market can result from excessive red tape that paralyzes its operation, as admitted by E. Bieńkowska, European Commissioner for Internal Market, Industry, Entrepreneurship, and SMEs (Bieńkowska, 2015). Large enterprises have the greatest chance of bypassing this barrier because it is easier for them to move their operations to less bureaucratic markets outside Europe.



**Figure 2.** Biplot showing the co-occurrence of market geographic coverage forms and enterprise types

## Characteristics of innovation activity of companies

The innovation activity of enterprises involves: research and development that may be pursued individually by a firm or outsourced to other entities; purchasing technologically advanced machinery and technical equipment, product and process innovation software, acquisition of knowledge from external sources; training of personnel and marketing activities associated with the introduction of new or significantly improved products. Table 5 is a contingency table that includes the numbers relating to the variables which describe innovation activity by enterprise type.

**Table 5.** Numbers for individual forms of innovation activity, enterprise types, as well as variable codes

Variables	Code	FR_1	FR_2	FR_3
R&D within the entity	AK_1	168	705	450
R&D outsourced	AK_2	82	420	308
Purchase of advanced technologies	AK_3	311	1202	674
Purchase of process and product innovation software	AK_4	173	653	421
Acquisition of knowledge from external sources for process and product innovation implementation	AK_5	86	304	217
Training of personnel directly associated with the introduction of new or significantly improved products and processes	AK_6	151	543	348
Marketing associated with the introduction of new or significantly improved products	AK_7	221	782	517
Designing, improvement and change of the form, appearance or utility of new or significantly improved products	AK_8	161	633	412
Preparations for the introduction of new or significantly improved products or processes	AK_9	220	801	536

**Source:** own elaboration based on questionnaire PNT-02: Report on industrial innovation for 2012–2014, Statistics Poland.

A chi-square test for independence was carried out to determine the relationship between the types of enterprises and the variables describing their innovation activity. This required the formulation of the following research hypotheses:

$H_0$ : forms of innovation activity do not depend on the enterprise type;

$H_1$ : forms of innovation activity depend on the enterprise type.

Table 6 presents the calculations necessary to verify the null hypothesis of the independence of an innovation activity form from the enterprise type. In this case  $p > \alpha$ , so the null hypothesis may not be rejected, which means the independence of a form of innovation activity from the enterprise type.

**Table 6.** Results of the verification of the hypothesis  $H_0$  regarding the independence of an innovation activity form from the enterprise type

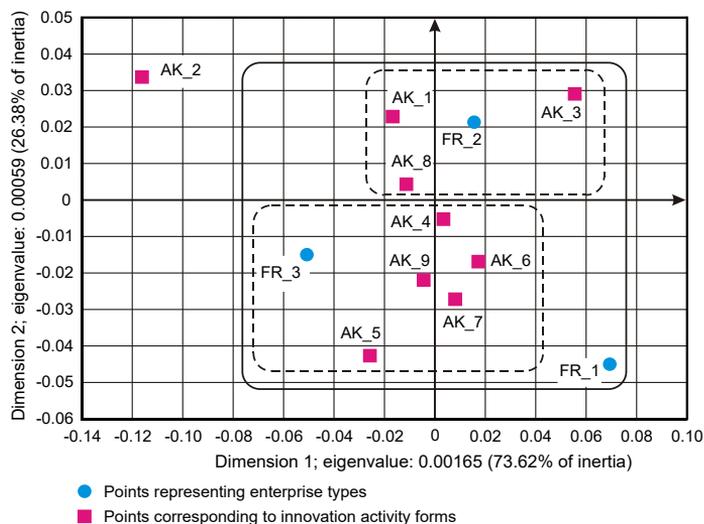
$\chi^2$ value	Degrees of freedom	Significance level ( $\alpha$ )	p-value
25.807	16	0.05	0.05688
Decision	Since $p > \alpha$ , there are no grounds for rejecting $H_0$		

Even though  $H_0$  is true, precise differentiation between forms of innovation activity by enterprise type may be performed by employing a correspondence analysis. Table 7 presents the coordinates of the points corresponding to the variables describing the innovation activity forms (rows) and those representing the enterprise types (column). The solution quality indicates complete representation of total inertia by two dimensions.

**Table 7.** Coordinates of the rows (forms of innovation activity) and the columns (enterprise types)

Row coordinates				
Row	Dimension		Mass	Quality
	Axis 1	Axis 2		
AK_1	-0.017	0.023	0.115	1.000
AK_2	-0.116	0.034	0.070	1.000
AK_3	0.055	0.029	0.190	1.000
AK_4	0.003	-0.005	0.108	1.000
AK_5	-0.026	-0.043	0.053	1.000
AK_6	0.017	-0.017	0.091	1.000
AK_7	0.007	-0.027	0.132	1.000
AK_8	-0.011	0.003	0.105	1.000
AK_9	-0.005	-0.022	0.135	1.000
Column coordinates				
Column	Dimension		Mass	Quality
	Axis 1	Axis 2		
FR_1	0.069	-0.045	0.137	1.000
FR_2	0.015	0.021	0.526	1.000
FR_3	-0.051	-0.015	0.338	1.000

Graphic interpretation of the relationships between a form of innovation activity and the enterprise type is shown in Figure 3. It follows from the biplot that innovation activity is characteristic of medium-sized and large companies, represented by FR\_2 and FR\_3, since almost every form of innovation activity revolves around them, which is additional confirmation of the null hypothesis. In fact, small enterprises (FR\_1) are located within the borders of the main square frame marked with a solid line, but only in its bottom right corner which points to relatively weak innovation activity of small companies. AK\_2 is an isolated point, which means that all the companies, regardless of their type, relatively seldom outsource R&D. Two square frames marked with a dotted line indicate diverse forms of innovation activity pursued by medium-sized (FR\_2) and large (FR\_3) companies. Medium-sized enterprises (FR\_2) conduct their own R&D (AK\_1); in addition, they purchase advanced technologies (AK\_3) and design new forms and appearances of products as part of product innovations (AK\_8). On the other hand, large enterprises (FR\_3) engage in various forms of activity, from AK\_4 through AK\_7 and AK\_9; they involve the purchase of process and product innovation software, acquiring knowledge from external sources to implement such innovations, training of personnel, marketing efforts associated with the introduction of product and process innovations, as well as preparatory work related to the introduction of such innovations. In other words, the graph confirms the great potential for innovation in medium-sized and large enterprises. However, another phenomenon may also be observed – great distances between the points representing innovation activity forms and those corresponding to enterprise types. This means that companies do not hurry to undertake immediate and decisive action in terms of innovation, which is probably associated with the persistence in 2012–2014 of the effects of the exogenous shock of 2008–2010. This trend is indicative of a certain reluctance to innovate, though it is evident that firms are aware of the need for innovation. The phenomenon in question might be of a more or less rational nature, but it still means waiting for some improvement in the economic situation. Managers consider the current risks associated with undertaking innovation activity to be substantial; this makes them prepare for the introduction of new or improved products in the future when the conditions are more favorable. They await a change in the economic conditions that will reduce the risks involved with innovation activity.



**Figure 3.** Biplot showing the co-occurrence of the forms of innovation activity and the types of enterprises

### Decisions of companies regarding innovations implemented

The exogenous innovation shock which took place during the global financial crisis influenced companies' decisions in terms of innovations to be implemented. Since its effects persisted in 2012–2014, one has to pose a research question about the impact of such new economic conditions on the types of innovation undertaken by firms depending on their type. To this end, Table 8 is provided, including the number of product/process, organizational and marketing innovations depending on enterprise size.

**Table 8.** Contingency table presenting the types of innovation implemented depending on enterprise size, and the variable codes

Types of innovation	Variables	Code	FR_1	FR_2	FR_3
Product innovations	Products – innovative goods	IWR	295	1152	664
	Products – innovative services	IUS	91	243	125
Process innovations	New innovative production processes	PRC_1	266	944	532
	New innovative production logistics processes	PRC_2	81	257	246
	New innovative management processes	PRC_3	128	521	387

Types of innovation	Variables	Code	FR_1	FR_2	FR_3
Organizational innovations	New methods under the principles of operation adopted	OR_1	164	555	422
	New methods of distribution of tasks and decision-making powers among employees	OR_2	157	439	374
	New organizational methods in terms of relations with the environment	OR_3	98	240	243
Marketing innovations	Significant changes in the design/construction and/or packaging of goods and/or services	IMK_1	126	365	285
	New media or product promotion methods	IMK_2	108	301	244
	New methods in terms of product distribution or sales channels	IMK_3	66	211	147
	New methods of pricing goods and services	IMK_4	105	268	155

Source: own elaboration based on questionnaire PNT-02: Report on industrial innovation for 2012–2014, Statistics Poland.

To verify the foregoing, a chi-square test for independence was performed. This required the following research hypotheses to be tested:

$H_0$ : types of innovation implemented do not depend on the enterprise size;

$H_1$ : types of innovation implemented depend on the enterprise size.

Table 9 illustrates the results of the null hypothesis verification concerning the independence of innovation types from company sizes. They show that the null hypothesis should be rejected in favor of the alternative hypothesis  $H_1$ , which means that the types of innovation implemented depend on the enterprise size.

**Table 9.** Results of the verification of the null hypothesis regarding the independence of innovation types from enterprise size

$\chi^2$ value	Degrees of freedom	Significance level ( $\alpha$ )	$p$ -value
117.36	22	0.05	0.000
Decision	Since $p < \alpha$ , $H_0$ needs to be rejected in favor of $H_1$		

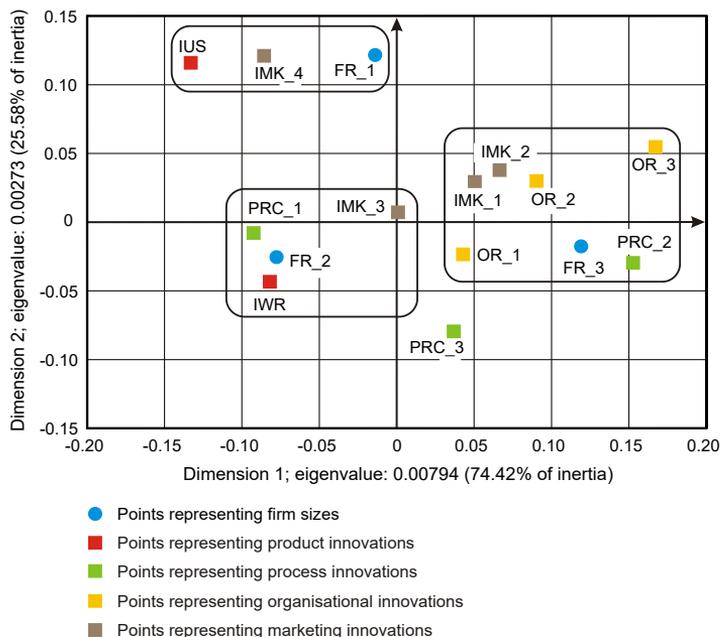
To clarify the relationships between types of innovation implemented and sizes of enterprise, a correspondence analysis was carried out. Table 10 presents the coordinates of the rows being types of innovation activity pursued as well as the coordinates of the columns containing sizes of companies. Again, this solution's quality is the best, i.e. equal to one, so the two-dimensional biplot accurately represents the co-occurrence of the studied phenomena.

**Table 10.** Coordinates of the rows (types of innovation activity) and the columns (enterprise sizes) with the mass and quality measures

<b>Row coordinates</b>				
<b>Row</b>	<b>Dimension</b>		<b>Mass</b>	<b>Quality</b>
	<b>Axis 1</b>	<b>Axis 2</b>		
IWR	-0.082	-0.043	0.192	1.000
IUS	-0.133	0.117	0.042	1.000
PRC_1	-0.093	-0.007	0.158	1.000
PRC_2	0.152	-0.030	0.053	1.000
PRC_3	0.036	-0.080	0.094	1.000
OR_1	0.043	-0.023	0.104	1.000
OR_2	0.090	0.030	0.088	1.000
OR_3	0.167	0.055	0.053	1.000
IMK_1	0.050	0.029	0.071	1.000
IMK_2	0.066	0.039	0.059	1.000
IMK_3	0.000	0.007	0.039	1.000
IMK_4	-0.086	0.121	0.048	1.000
<b>Column coordinates</b>				
<b>Column</b>	<b>Dimension</b>		<b>Mass</b>	<b>Quality</b>
	<b>Axis 1</b>	<b>Axis 2</b>		
FR_1	-0.014	0.123	0.153	1.000
FR_2	-0.078	-0.025	0.499	1.000
FR_3	0.118	-0.018	0.347	1.000

Figure 4 shows the co-occurrence of innovation activity types and enterprise sizes. As far as small enterprises (FR\_1) are concerned, it shows that they introduced innovative services (IUS) to the local market, simultaneously using new methods of goods and services pricing (IMK\_4). Medium-sized enterprises (FR\_2) focused on innovative goods (IWR), implemented new innovative production processes (PRC\_1), and developed new methods in terms of product distribution or sales channels (IMK\_3). On the other hand, large enterprises (FR\_3) employed new innovative production logistics processes (PRC\_2), implemented all three organizational innovation forms (OR\_1, OR\_2, OR\_3), introduced substantial changes in the design/construction and/or packaging of goods and/or services (IMK\_1) when it comes to marketing innovations, and used new media and/or improved product promotion methods (IMK\_2) in their promotion efforts. One needs to note that PRC\_3 is relatively isolated, which means that companies rarely use new innovative management processes. These results indicate that the effects of the exogenous innovation shock mostly affected large innovative

enterprises, which later concentrated primarily on improving production logistics processes as well as on organizational and marketing innovations. The whole burden of product innovation rests on small and medium-sized companies, which were found to be the most resilient to innovation shock.



**Figure 4.** Biplot showing the co-occurrence of the types of innovation and the sizes of enterprises

### Methods of product innovation development

Innovative enterprises may develop products on their own or in cooperation with other national or foreign entities; they can also modify products individually or together with other entities. National and foreign scientific institutions or other domestic companies may take part in developing innovative products as well. Table 11 illustrates the variables for the development and modification of innovative products depending on the enterprise type. This will constitute the basis for further calculations concerning companies' decisions in this regard.

**Table 11.** Methods of product innovation development depending on enterprise types and variable codes

Variables	Code	FR_1	FR_2	FR_3
Development of innovative products by the company	IPD_1	244	943	504
Development of innovative products by the company and in cooperation with other national entities	IPD_2	59	243	196
Development of innovative products by the company and in cooperation with other foreign entities	IPD_3	9	76	120
Development of innovative product modifications by the company and in cooperation with other entities	IPD_4	22	70	66
Development of innovative products by national scientific institutions	IPD_5	13	51	40
Development of innovative products by foreign institutions – companies and/or scientific institutions	IPD_6	14	51	79
Development of innovative products by other domestic companies	IPD_7	23	50	24

**Source:** own elaboration based on questionnaire PNT-02: Report on industrial innovation for 2012–2014, Statistics Poland.

Solving the problem of the relationships between types of companies and their decisions regarding innovative product development and modification requires a chi-square test for independence to be performed. The null hypothesis needs to be tested for the lack of dependencies between the enterprise type and the innovative product development and modification method:

$H_0$ : product innovation development methods do not depend on the enterprise type;

$H_1$ : product innovation development methods depend on the enterprise type.

Table 12 presents the calculations for the verification of the null hypothesis across the variables studied. Because  $p < \alpha$ , it is necessary to reject the null hypothesis in favor of the alternative hypothesis, according to which product innovation development methods do depend on the enterprise type.

**Table 12.** Results of the verification of the null hypothesis regarding the independence of product innovation development methods from enterprise types

$\chi^2$ value	Degrees of freedom	Significance level ( $\alpha$ )	$p$ -value
115.63	12	0.05	0.0000
Decision	Since $p < \alpha$ , $H_0$ needs to be rejected in favor of $H_1$		

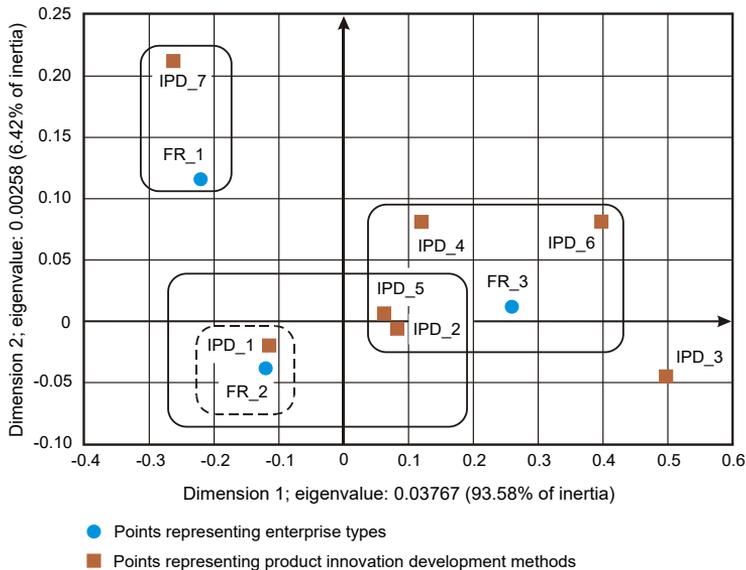
A more detailed analysis of relationships when it comes to companies' decisions regarding product innovation development methods requires a correspondence analysis to be performed. Table 13 includes the coordinates of the rows (product innovation development methods) and the columns (enterprise types) with the mass of the variables and the solution's quality. The table shows that exactly two dimensions explain the entire inertia of the system studied.

**Table 13.** Coordinates of the rows (product innovation development methods) and the columns (enterprise types)

<b>Row coordinates</b>				
<b>Row</b>	<b>Dimension</b>		<b>Mass</b>	<b>Quality</b>
	<b>Axis 1</b>	<b>Axis 2</b>		
IPD_1	-0.118	-0.020	0.584	1.000
IPD_2	0.082	-0.005	0.172	1.000
IPD_3	0.496	-0.045	0.071	1.000
IPD_4	0.119	0.081	0.055	1.000
IPD_5	0.061	0.006	0.036	1.000
IPD_6	0.396	0.081	0.050	1.000
IPD_7	-0.265	0.212	0.033	1.000
<b>Column coordinates</b>				
<b>Column</b>	<b>Dimension</b>		<b>Mass</b>	<b>Quality</b>
	<b>Axis 1</b>	<b>Axis 2</b>		
FR_1	-0.222	0.116	0.133	1.000
FR_2	-0.121	-0.038	0.512	1.000
FR_3	0.258	0.012	0.355	1.000

Figure 5 illustrates the decisions regarding product innovation development methods made by individual enterprise types. Beginning with small enterprises (FR\_1), one may notice that they usually use innovative product developments designed by other domestic companies (IPD\_7). The so-called imitation effect is used here. It is understandable because those firms have limited access to such production factors as labor and capital. The points representing medium-sized and large enterprises, FR\_2 and FR\_3, together with their respective decisions, are situated near the origin of the coordinate system, which indicates the presence of a certain standard among the studied enterprises. Medium-sized companies (FR\_2) most frequently develop innovative products on their own (IPD\_1), as evidenced by the dotted-line frame. In addition, they collaborate in this respect with other national entities (IPD\_2) and employ solutions proposed by national scientific

institutions (IPD\_5), as evidenced by the solid-line frame. Large enterprises (FR\_3) also choose already-mentioned IPD\_2 and IPD\_5 characteristic of medium-sized companies, although they also develop innovative product modifications on their own and in cooperation with other entities (IPD\_4), outsource innovative product development to foreign institutions (IPD\_6), as well as (perhaps) create innovative products on their own and in cooperation with other foreign entities (IPD\_3). The last point on the biplot seems to be relatively isolated, thus the corresponding innovative product development method is seldom selected. The relatively large distance between the points representing the enterprise types and the points corresponding to the innovative product development methods is worrying as it means the slow emergence of innovative thought among industrial companies in Poland. Some exceptions here are FR\_2 and IPD\_1 situated close to each other, which has already been interpreted. This trend looks quite permanent, which necessitates studying barriers to innovation. It may be the case that following the exogenous innovation shock, its effects turned out to be relatively constant. This problem is discussed further in the article.



**Figure 5.** Biplot showing the co-occurrence of the product innovation development methods and the types of companies

## Methods of process innovation development

Companies can choose from several innovative process development and modification methods. They may develop processes on their own or in cooperation with other national or foreign entities; they may also modify processes on their own or together with other entities. National and foreign companies and/or scientific institutions may take part in developing innovative processes as well. Table 14 illustrates the variables for the development and modification of innovative processes depending on the type of enterprise. This will further underpin calculations concerning process development methods chosen by companies of various types.

**Table 14.** Process innovation development methods and enterprise types as well as variable codes

Variables	Code	FR_1	FR_2	FR_3
Development of innovative processes by a company	IPC_1	209	742	409
Development of innovative processes by a company and in cooperation with other national entities	IPC_2	56	233	162
Development of innovative processes by a company and in cooperation with other foreign entities	IPC_3	9	73	98
Development of innovative process modifications by a company and in cooperation with other entities	IPC_4	32	93	73
Development of innovative processes by national scientific institutions	IPC_5	15	37	25
Development of innovative processes by foreign institutions –companies and/or scientific institutions	IPC_6	13	69	69
Development of innovative processes by other domestic companies	IPC_7	44	145	64

**Source:** own elaboration based on questionnaire PNT-02: Report on industrial innovation for 2012–2014, Statistics Poland.

The problem of process innovation development method selection may be solved with a chi-square test for independence. In this case, the following hypotheses are tested:

$H_0$ : process innovation development methods do not depend on the enterprise type;

$H_1$ : process innovation development methods depend on the enterprise type.

Results of the verification of the null hypothesis regarding the independence of process innovation development methods from enterprise

types are presented in Table 15. A comparison between the  $p$ -value and the significance level  $\alpha$  suggests that the null hypothesis should be rejected in favor of the alternative hypothesis. Thus, process innovation development and modification methods depend on the firm type.

**Table 15.** Results of the verification of the null hypothesis regarding the independence of process innovation development methods from enterprise types

$\chi^2$ value	Degrees of freedom	Significance level ( $\alpha$ )	$p$ -value
71.548	12	0.05	0.0000
Decision	Since $p < \alpha$ , $H_0$ needs to be rejected in favor of $H_1$		

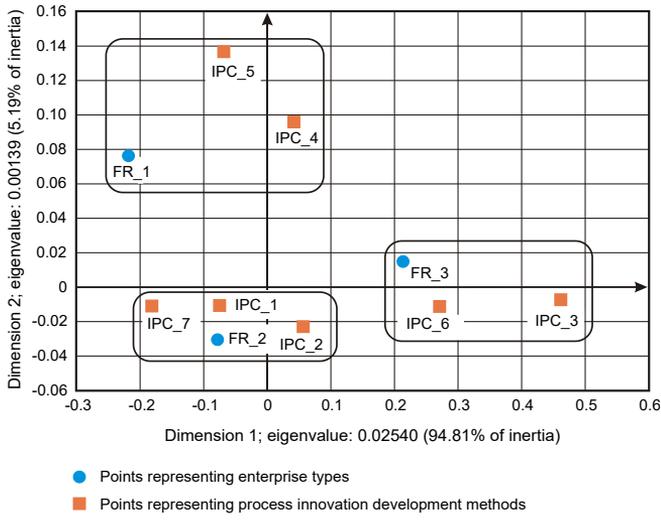
Table 16 contains the coordinates of the rows representing the available methods of innovative process development and modification as well as the coordinates of the columns corresponding to the types of enterprises. It also includes the mass of individual variables and the statistics of the solution's quality. The total inertia of the system studied is explained in two dimensions.

**Table 16.** Coordinates of the rows (available innovative process development and modification methods) and the columns (enterprise types)

Row coordinates				
Row	Dimension		Mass	Quality
	Axis 1	Axis 2		
IPC_1	-0.077	-0.010	0.509	1.000
IPC_2	0.056	-0.023	0.169	1.000
IPC_3	0.461	-0.007	0.067	1.000
IPC_4	0.040	0.096	0.074	1.000
IPC_5	-0.070	0.137	0.029	1.000
IPC_6	0.269	-0.011	0.057	1.000
IPC_7	-0.183	-0.011	0.095	1.000
Column coordinates				
Column	Dimension		Mass	Quality
	Axis 1	Axis 2		
FR_1	-0.219	0.076	0.142	1.000
FR_2	-0.079	-0.031	0.521	1.000
FR_3	0.214	0.015	0.337	1.000

The biplot shown in Figure 6 rather clearly differentiates process innovation development methods depending on the enterprise type, which is an additional argument in favour of the alternative hypothesis. Small enterprises (FR\_1) modify processes on their own and in cooperation with other entities (IPC\_4)

and use innovative processes developed by national scientific institutions (IPC\_5). However, the distances between point FR\_1 and points IPC\_4 and IPC\_5 are quite considerable, which is indicative of the relatively rare use of those solutions. When it comes to medium-sized enterprises (FR\_2), there are substantially more available innovative process development methods; they are also used more often, as evidenced by the shorter distances between the point representing medium-sized enterprises and the points corresponding to the selected methods. Such companies develop innovative processes by themselves (IPC\_1) and in cooperation with other national entities (IPC\_2), but also take advantage of innovative processes developed by other domestic companies (IPC\_7). Large enterprises (FR\_3) develop innovative processes on their own and in cooperation with other foreign entities (IPC\_3) as well as use innovative processes developed by foreign scientific institutions (IPC\_6). The solution to the problem proves that in the case of small companies, the exogenous shock effects are still visible and the same partly applies to large enterprises, particularly regarding IPC\_3, as evidenced by the relatively large distance between points FR\_3 and IPC\_3.



**Figure 6.** Correspondence map showing the co-occurrence of process innovation development methods and enterprise types

**Eco-innovation**

Eco-innovations are a distinct form of innovation activity, and their importance in contemporary economies has been on the rise. The goals of eco-innovation

include ensuring sustainable development by reducing the adverse effects of industrial activity on the environment, improving natural conditions, as well as using natural resources responsibly. This form of innovation is increasingly relevant to industrial companies, since it indirectly decreases operational costs, provides companies with new growth opportunities, and is of importance in shaping a positive corporate identity. According to the PNT-02 statistical form, two categories of eco-innovation-related environmental benefits are distinguished: those obtained during the period of manufacturing by the enterprise of goods or services and those obtained during the period of use of the purchased product or use of the service by final users. The first group includes decreased material consumption rate, water consumption per product unit, energy consumption rate, and carbon footprint; reduced soil, water, and air pollution; less noise; use of less polluting and less hazardous materials for the environment; less energy from fossil fuels and more energy from renewable sources; recycling of waste, water or materials for the entity's own purpose or for sale. The second group includes decreased energy consumption rate and carbon footprint; lower air, water, and soil pollution; less noise; easier recycling of a product after its use period; as well as extended use period of products thanks to increased durability and tolerance. Table 17 illustrates the forms of eco-innovation depending on enterprise types.

**Table 17.** Forms of eco-innovation depending on enterprise types, and variable codes

<b>Environmental benefits</b>	<b>Variables</b>	<b>Code</b>	<b>FR_1</b>	<b>FR_2</b>	<b>FR_3</b>
Benefits obtained during the period of company's manufacturing of goods and/or services	Decreased material and/or water consumption rate per product unit	EK_1	158	447	332
	Decreased energy consumption rate and/or carbon footprint	EK_2	167	507	373
	Decreased soil, water, air pollution and/or less noise	EK_3	182	439	332
	Use of materials less polluting or less hazardous to the environment	EK_4	174	381	257
	Less energy from fossil fuels and more energy from renewable sources	EK_5	64	104	90
	Recycling of waste, water, and/or materials for the entity's own purposes or for sale	EK_6	223	509	352

Environmental benefits	Variables	Code	FR_1	FR_2	FR_3
Benefits obtained in the period of final user's use of goods and/or services purchased	Decreased energy consumption rate and/or carbon footprint	EK_7	172	389	246
	Decreased soil, water, air pollution and/or less noise	EK_8	168	390	233
	Easier recycling of a product after its use period	EK_9	136	284	160
	Extended product use period thanks to increased durability and tolerance	EK_10	189	385	213

Source: own elaboration based on questionnaire PNT-02: Report on industrial innovation for 2012–2014, Statistics Poland.

Determining the relationships between the form of eco-innovation and an enterprise type requires a chi-square test for independence to be carried out. To this end, the following hypotheses were taken into consideration:

$H_0$ : forms of eco-innovation do not depend on the type of enterprise;

$H_1$ : forms of eco-innovation depend on the type of enterprise.

Results of the verification of the null hypothesis regarding the independence of eco-innovation form choice from enterprise types are presented in Table 18. The  $p$ -value is considerably lower than the significance level  $\alpha$ , so  $H_0$  has to be rejected in favor of the alternative hypothesis. Therefore, the form of eco-innovation depends on the type of enterprises.

**Table 18.** Results of the verification of the null hypothesis regarding the independence of eco-innovation form choice from enterprise types

$\chi^2$ value	Degrees of freedom	Significance level ( $\alpha$ )	$p$ -value
55.228	18	0.05	0.0001
Decision	Since $p < \alpha$ , $H_0$ needs to be rejected in favor of $H_1$		

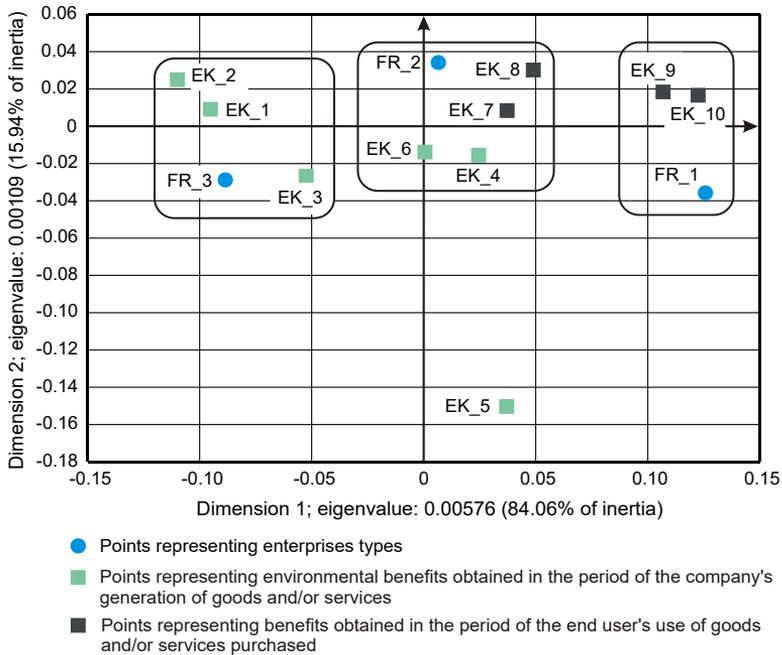
Table 19 shows the coordinates of the rows corresponding to eco-innovation forms, as well as the coordinates of the columns associated with enterprise types. It also shows the row and column mass, as well as the statistics of the solution's quality. Two dimensions allow for full representation of the total inertia of the system.

**Table 19.** Coordinates of the rows (forms of eco-innovation) and the columns (enterprise types)

<b>Row coordinates</b>				
<b>Row</b>	<b>Dimension</b>		<b>Mass</b>	<b>Quality</b>
	<b>Axis 1</b>	<b>Axis 2</b>		
EK_1	-0.095	0.010	0.116	1.000
EK_2	-0.112	0.025	0.130	1.000
EK_3	-0.052	-0.027	0.118	1.000
EK_4	0.024	-0.016	0.101	1.000
EK_5	0.037	-0.149	0.032	1.000
EK_6	0.000	-0.013	0.135	1.000
EK_7	0.037	0.009	0.100	1.000
EK_8	0.049	0.030	0.098	1.000
EK_9	0.107	0.019	0.072	1.000
EK_10	0.122	0.017	0.098	1.000
<b>Column coordinates</b>				
<b>Column</b>	<b>Dimension</b>		<b>Mass</b>	<b>Quality</b>
	<b>Axis 1</b>	<b>Axis 2</b>		
FR_1	0.126	-0.036	0.203	1.000
FR_2	0.006	0.035	0.476	1.000
FR_3	-0.089	-0.029	0.321	1.000

A graphic representation of the co-occurrence of the studied phenomena was prepared based on Table 19. Figure 7 illustrates the correspondence map presenting the co-existence of eco-innovation forms and enterprise types. Small enterprises (FR\_1) focus on environmental benefits achieved during the period of the final user's use of goods or services purchased. In particular, this includes easier recycling of a product after its use period (EK\_9) and extended product use period thanks to increased durability and tolerance (EK\_10). For medium-sized enterprises (FR\_2), there are both benefits obtained in the period of the company's generation of goods and/or services and those obtained in the period of the end user's use of goods and/or services purchased. The first benefit category relates to the use of materials less polluting or less hazardous to the environment (EK\_4) as well as the recycling of waste, water and/or materials for a company's own purposes or for sale (EK\_6). The second benefit category is achieved through a decreased energy consumption rate and/or carbon footprint (EK\_7) and decreased soil, water, air pollution and/or less noise (EK\_8). In the group of large enterprises (FR\_3), there are solely environmental benefits obtained in the period of the company's generation of goods and/or services which include decreased material and/or water

consumption rate per product unit (EK\_1), decreased energy consumption rate and/or carbon footprint (EK\_2), and decreased soil, water, air pollution and/or less noise (EK\_3). It ought to be noted that the most representative enterprise in terms of eco-innovation are medium-sized ones because point FR\_2 corresponding to them and points EK\_4 and EK\_6 as well as EK\_7 and EK\_8 – corresponding to both benefit categories – are concentrated around the origin of the coordinate system. This means that medium-sized enterprises set the standard of eco-innovation in Poland since their choices are the most diverse ones. In contrast, small and large enterprises have selected their own strategies for eco-innovation and focused on other environmental benefits. What might be found distressing is the relatively large distance between the points representing the enterprise types and the points indicating the decisions regarding individual forms of eco-innovation. This can indicate that the effects of the exogenous innovation shock are still being felt and/or that people are not environmentally aware to a sufficient extent. However, the distances are relatively slightly shorter than those presented in Figures 5–6, which most probably indicates the growing interest of Polish companies in eco-innovation.



**Figure 7.** Biplot showing the co-occurrence of eco-innovation forms and types of enterprises

## Barriers to innovation

Barriers to innovation are an important factor hindering the economic growth of a country; thus, their causes should be researched thoroughly. The firms that are persistent innovators may perceive such barriers in a different way than occasional innovators, which affects differences in the frequency of innovation implementation (Wziątek-Kubiak, Pęczkowski, & Balcerowicz, 2011). The reasons behind the lack of interest in innovation and the occurrence of barriers to innovation include the impossibility to fund innovation with a company's own funds or from external sources in the form of bank loans or funds from private equity (including venture capital), the lack of adequately qualified personnel, difficulties in obtaining public grants or subsidies for innovation, the lack of business partners, uncertain market demand for innovation concepts, as well as high market competition. Table 20 illustrates the barriers to innovation and their significance to enterprises.

**Table 20.** Barriers to innovation and their significance for enterprises, and variable codes

Variables	Code	Degree of significance			
		A (high)	B (average)	C (low)	D (insignificant)
Impossibility to fund innovation with company's own funds	BRI_1	1701	1325	720	2872
Impossibility to fund innovation from external sources in the form of bank loans or funds from private equity (including venture capital)	BRI_2	1180	1571	856	3011
Lack of adequately qualified personnel	BRI_3	704	1611	1105	3198
Difficulties in obtaining public grants or subsidies for innovation	BRI_4	1214	1329	815	3260
Lack of business partners	BRI_5	761	1546	997	3314
Uncertain market demand for innovation concepts	BRI_6	1068	1584	881	3085
High market competition	BRI_7	1077	1568	869	3104

**Source:** own elaboration based on questionnaire PNT-02: Report on industrial innovation for 2012–2014, Statistics Poland.

Table 20 contains the variables in the form of barriers to innovation as well as four degrees of their significance for companies. However, this

information is insufficient to determine their relationship with individual types of enterprises. Correspondence analysis allows for defining supplementary points that help establish the co-occurrences between variables. Table 21 contains supplementary points standing for enterprise types depending on the level of significance of individual barriers to innovation.

**Table 21.** Supplementary points standing for enterprise types depending on the level of significance of individual barriers to innovation

Variables	A (high)	B (average)	C (low)	D (insignificant)
FR-1	869	550	272	1234
FR-2	751	673	368	1392
FR-3	81	102	80	246

To determine relationships between barriers to innovation and enterprise types, a chi-square test for independence was performed. This required the formulation of the following research hypotheses:

$H_0$ : barriers to innovation do not depend on enterprise types;

$H_1$ : barriers to innovation depend on enterprise types.

Table 22 presents the results of the verification of the  $H_0$  hypothesis regarding the independence of barriers to innovation from enterprise types. The inequality  $p < \alpha$  points to the necessity of rejecting the null hypothesis in favor of the alternative hypothesis. Therefore, it needs to be concluded that barriers to innovation depend on the enterprise type.

**Table 22.** Results of the verification of the  $H_0$  hypothesis regarding the independence of barriers to innovation from enterprise types

$\chi^2$ value	Degrees of freedom	Significance level ( $\alpha$ )	$p$ -value
803.945	18	0.05	0.0000
Decision	Since $p < \alpha$ , $H_0$ needs to be rejected in favor of $H_1$		

Table 23 shows the coordinates of the rows representing the barriers to innovation and enterprise types as well as the coordinates of the columns corresponding to four degrees of significance of these barriers for innovative companies studied. There is also the row and column mass as well as the statistics of the solution's quality. In this case, the row and column quality is slightly lower than one, and the only exception is the barrier of excessively high market competition (BRI\_7), whose quality is 0.523. This allows one to

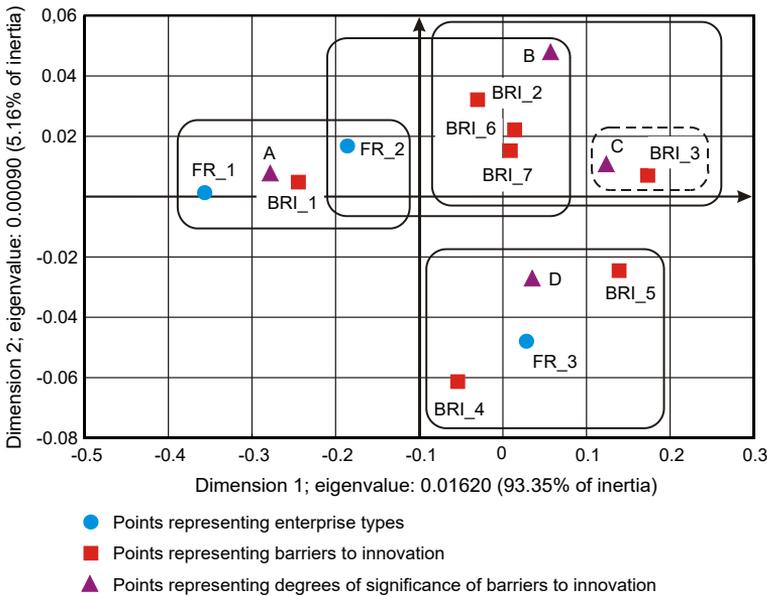
present 98.51% of the total inertia of the system studied in two dimensions, which is still a very good result (98.51% > 75%).

**Table 23.** Coordinates of the rows (barriers to innovation and enterprise types) and the columns (degree of significance of individual barriers to innovation)

Row coordinates				
Row	Dimension		Mass	Quality
	Axis 1	Axis 2		
BRI_1	-0.246	0.005	0.143	0.994
BRI_2	-0.031	0.032	0.143	0.964
BRI_3	0.173	0.011	0.143	0.972
BRI_4	-0.055	-0.061	0.143	0.995
BRI_5	0.138	-0.024	0.143	0.999
BRI_6	0.013	0.022	0.143	0.775
BRI_7	0.008	0.015	0.143	0.523
FR_1	-0.246	0.005	0.143	0.994
FR_2	-0.031	0.032	0.143	0.964
FR_3	0.173	0.011	0.143	0.972
Column coordinates				
Column	Dimension		Mass	Quality
	Axis 1	Axis 2		
A	-0.277	0.007	0.166	0.999
B	0.058	0.047	0.227	0.968
C	0.124	0.010	0.135	0.918
D	0.035	-0.028	0.472	0.978

Figure 8 illustrates a biplot indicating the co-occurrence of the points standing for barriers to innovation, degrees of their significance and enterprise types. For small enterprises (FR\_1), of utmost importance is the barrier of impossibility to finance innovation from the company's internal sources (BRI\_1), whose degree of significance is high (A). For medium-sized enterprises (FR\_2), the situation is similar as far as BRI\_1 is concerned, but BRI\_2 is also present – the impossibility to fund innovation from external sources, as well as BRI\_6 – uncertain market demand for innovation concepts, and BRI\_7 – high market competition. The distances of three points BRI\_2, BRI\_6, and BRI\_7 from point B, standing for their average degree of significance, does not imply particular significance of these barriers to the development of medium-sized enterprises. Perhaps these barriers did not prove too burdensome in terms of the innovation activity they pursued. The concentration of these barriers in a relatively limited space suggests

that companies perceive them in a similar way. When it comes to large enterprises (FR\_3), the following barriers proved to be of no significance (D): BRI\_4 – difficulties in obtaining public grants or subsidies for innovation and BRI\_5 – lack of business partners. The distances between the remaining points representing barriers to innovation and point FR\_3 means that large companies do not find the said barriers to be a significant factor restricting their innovation activity. Thus, possible restrictions of innovation activity must stem from other reasons. However, for all enterprises, barrier BRI\_3 – lack of adequately qualified personnel – turned out to be of low significance (C), as highlighted by the dotted-line frame. This means that companies engaged in industrial processing in Poland do not experience shortages of well-qualified workers.



**Figure 8.** Biplot illustrating the co-occurrence of barriers to innovation and degrees of their significance to individual enterprise types

## DISCUSSION

The calculations presented above prove that a majority of the variables describing the innovativeness of companies engaged in industrial processing depends on their type, i.e. on whether they are small, medium-sized or

large. This relationship is clearly visible when it comes to market geographic coverage since it is directly proportional to enterprise size (Figure 2). The literature concerning this subject also lists other development factors, affecting the geographical scope of the market of innovative enterprises, which are particularly important from the perspective of their presence on international markets, such as using business counseling services or the ability to quickly absorb business knowledge (Stawasz, 2019).

The only exception here is the independence of forms of innovation activity from enterprise types, which is logical as only innovative companies were studied. However, medium-sized and large enterprises innovate more actively, since almost all the points in Figure 3 corresponding to the forms of innovation activity revolve around the points representing these companies. Small enterprises have the greatest difficulties with innovating; it is understandable, bearing in mind that they have limited financial resources. A similar relationship occurs when it comes to innovation diversity, where medium-sized and large enterprises prevail (Figure 4). However, small and medium-sized enterprises are the most flexible and resilient to exogenous innovation shock effects, as evidenced by their leadership in product/process innovation in subsequent years. On the other hand, large companies focused at that time primarily on improving production logistics processes as well as organizational and marketing innovations.

As far as product innovation development methods are concerned, the widest diversity of approaches is characteristic of large enterprises (Figure 5). Small and medium-sized firms focus mainly on selected development methods, i.e. small enterprises imitate and use solutions developed by other national companies, whereas medium-sized enterprises develop innovative products on their own. Process innovation development methods are considerably diverse, depending on enterprise types (Figure 6). Here, the main role is played by medium-sized and large enterprises because they use multiple development methods, though small companies are not far behind in this regard – they modify innovative processes by themselves and in cooperation with other entities and use innovative processes developed by national scientific institutions.

Currently, the most important aspect of innovation activity pursued by enterprises is eco-innovation. This form of innovation contributes to sustainable development through neutralization of the adverse impact of industrial processing on the environment, protects the environment and fosters more reasonable and responsible use of natural resources. Eco-innovations bring a variety of benefits to companies implementing them and have been slowly becoming the core goal of innovation activity. In terms of implementing various forms of eco-innovation, there are also medium-sized

enterprises that achieve the greatest advantages through them (Figure 7). In addition, it is a crucial field of innovation activity for large companies. It needs to be added that small enterprises are active in this area as well because they implement eco-innovations pertaining both to the recycling of product after their use period and to extending the product use period thanks to increased product durability and tolerance.

The focus of Polish enterprises on eco-innovations implies a willingness to make a sharp jump forward to skip over certain phases in economic development related to traditional innovations and demonstrates an experience-based learning process. Most probably, such a situation is the effect of an environmentally-friendly economic policy, whose popularity is constantly growing in the European Union.

Considering the barriers to innovation, it has to be noted that most of them are not too burdensome for large companies; they do not find it difficult to obtain public grants or subsidies for innovation, nor do they complain about a lack of business partners (Figure 8). These barriers do not limit small and medium-sized enterprises to a substantial extent either, as the only serious difficulty for them is the impossibility to fund innovation on their own. Medium-sized enterprises indicate a certain problem with funding innovation from external sources, in the form of credits or funds under private equity, but the degree of significance of this barrier is not high. A majority of the barriers are concentrated in a limited area of the biplot shown in Figure 8, and their degree of significance is believed by companies to be average or low. The fact that companies engaged in industrial processing find barriers to innovation of relatively slight importance means that the exogenous innovation shock effects are slowly fading away.

## CONCLUSION

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The innovation activity of companies involved in industrial processing in Poland, despite a slow decrease in the significance of barriers to innovation, shows certain signs of stagnation in 2012–2014. A thorough analysis of the biplot presented in Figure 3 demonstrates that even though the general conclusion of the independence of an innovation activity form of an enterprise type is valid, relatively large distances between the points corresponding to the enterprises types and to the innovation activity forms mean that companies generally avoid decisive innovation-related action; this particularly applies to small enterprises. A similar phenomenon may be observed on the biplot shown in Figure 5, where large distances are generally visible between the points corresponding to the product innovation development

methods and to the enterprise types. What is more, the points on the biplot in Figure 6 representing the process innovation development methods and the enterprise types are large distances from each other. Therefore, there is a certain reluctance towards innovation, although companies are clearly aware of the need to innovate. This problem can be explained in multiple ways. First of all, the current risks associated with innovating might be considered quite high by companies, as a result of which they can wait for a substantial improvement in the economic situation. The other explanation hinges upon the negative experiences from the innovation shock of 2008–2010, which can lead to the emergence of some psychological barriers and excessive caution in developing and implementing innovations. This is to some extent inconsistent with a low level of significance of a majority of the barriers to innovation reported by companies (Jakimowicz & Rzeczkowski, 2019). The detailed analysis of the biplot shown in Figure 7 does not seem to fully support either of the aforementioned explanations as it illustrates the co-occurrence of various forms of eco-innovation and enterprise types. Thus, another, more probable explanation of these differences needs to be found.

Eco-innovation is a reasonably new kind of innovation activity; not only does it bring industrial companies measurable benefits, but it is also supposed to protect the environment from industrial activities and reinforces the positive corporate identity of the company. The importance of eco-innovation is emphasized in *Oslo Manual 2018* (OECD/Eurostat, 2018, p. 166) which positions the development of environmentally friendly products as one of the factors pertaining to the innovation objectives and outcomes. Eco-innovation varies considerably from other forms of innovation so it is reasonable – with regard to the studies conducted – to divide innovation into eco-innovation and traditional innovation. A quite characteristic feature of the biplot in Figure 7 is also the fact that the points representing individual forms of eco-innovation are situated at relatively short distances from the points corresponding to enterprise types. In addition, there is a distinctive group of points associated with different forms of eco-innovation around each of the enterprise types, which suggests that small, medium-sized and large enterprises specialize in their respective, and simultaneously distinct, forms of eco-innovation. This results in a certain type of specialization and is favorable for the national economy. Ultimately, it has to be concluded that the innovation stagnation observed among firms pertains exclusively to traditional innovation, while eco-innovations are becoming increasingly popular among Polish companies engaged in industrial processing.

The comprehensive study concerning the issue of innovation in Polish enterprises in the industrial processing sector presented in this paper, covering relations between sixty-three variables, is unique in the literature.

The presented analysis offers many more conclusions and interpretations regarding the investment strategy of enterprises than has been described in the paper. In view of the broad scope of the issue and its complex nature, the paper discusses only basic relations. Biplots and tables included in the paper provide more varied and detailed results, particularly regarding the interpretation of rows and column masses and the point quality. An in-depth analysis of tables and biplots is available to readers without access to the large database of the Central Statistical Office (GUS), providing an opportunity to independently discover and interpret numerous interdependences which may be of interest to them.

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### Abstrakt

Celem artykułu jest określenie strategii innowacyjnej polskich przedsiębiorstw przetwórstwa przemysłowego w okresie 2012–2014, a więc po negatywnym szoku zewnętrznym, którego eskalacja wystąpiła w latach 2008–2010 i związana była z globalnym kryzysem finansowym. Zakresem badania objęto typy przedsiębiorstw (małe, średnie i duże), zasięg geograficzny rynków zbytu, rodzaje działalności innowacyjnej przedsiębiorstw, wybory przedsiębiorstw w zakresie form wprowadzanych innowacji, sposoby opracowania przez nie innowacji produktowych i procesowych, rodzaje ekoinnowacji najczęściej występujące w przetwórstwie przemysłowym i bariery innowacyjności. Ogółem weryfikacji statystycznej z wykorzystaniem testu niezależności poddano siedem szczegółowych hipotez badawczych. Następnie – ze względu na dużą ilość zmiennych uwzględnionych w badaniu i konieczność uszczegółowienia zależności między nimi – posłużono się analizą korespondencji. Jej istotą jest redukcja wielowymiarowej przestrzeni, w której zachodzą badane zjawiska, do przestrzeni o mniejszej liczbie wymiarów, w tym przypadku dwuwymiarowej. Pozwala to na dogodną analizę współwystępowania zjawisk na wykresach zwanych biplotami. Odkryto stosunkowo małą skłonność przedsiębiorstw do innowacji i ostrożność w ich podejmowaniu, co może wynikać z względnej trwałości skutków szoku egzogenicznego. Jednocześnie rysuje się wyraźna tendencja do podejmowania w szerszym zakresie ekoinnowacji, przy powolnym zmniejszaniu się – w odczuciu przedsiębiorstw – stopni znaczenia barier innowacyjności. Wnioski praktyczne wynikające z badań wskazują na konieczność zaakcentowania w polityce proinnowacyjnej korzyści wynikających z innowacji, a w szczególności ekoinnowacji, co pozwoli na pokonanie negatywnych skutków szoku zewnętrznego w postaci barier psychologicznych i nadmiernej ostrożności w planowaniu i wdrażaniu innowacji. W artykule zawarto oryginalną, unikalną i kompleksową analizę współzależności między sześćdziesięcioma trzema zmiennymi opisującymi działalność innowacyjną przedsiębiorstw. Wartość artykułu polega więc

na nowatorskim i stricte empirycznym ujęciu problemów innowacyjności przedsiębiorstw przetwórstwa przemysłowego, co powoduje, że zaprezentowane w nim badania mogą stać się potencjalnym wzorcem do takich analiz w przyszłości.

**Słowa kluczowe:** przedsiębiorstwa przetwórstwa przemysłowego, strategia innowacyjna, bariery innowacyjności, ekoinnowacje, analiza korespondencji

## Biographical notes

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# Developing an entrepreneurial mindset for transformational entrepreneurship: The case of Nordic transformative learning circles

Victoria Konovalenko Slettlī 

## Abstract

*Developing entrepreneurial thinking and mindset has recently been on the agenda of the EU policy makers and is a matter of educators' concern. Traditional approaches to entrepreneurial education fail to address the ambiguities of the entrepreneurial process. This paper sets out to explore the learning processes that contribute to developing an entrepreneurial mindset for transformational entrepreneurship. Transformational entrepreneurship refers to a capability and an intended action towards creating change in the life of an entrepreneur and organization which contributes to societal changes and is characterized by the emergence of a new qualitative dimension of possibilities (Staffas, 2017). In order to promote transformational entrepreneurship, a particular adult learning model known as Transformative Learning Circles was elaborated by Nordic Network for Adult Learning with the support of Nordic Council of Ministers. This article is based on the study of the pilot implementation of the TLC model in the context of Nordic countries. The findings reveal that learning processes promoting entrepreneurial mindsets for transformational entrepreneurship occur in three particular phases: 1) framing the praxis; 2) amplifying the frame of reference; and 3) reinterpreting the praxis. The study extends current knowledge about entrepreneurial learning in two ways. First, it links the key factors influencing entrepreneurial learning to concrete learning processes facilitating the development of an entrepreneurial mindset for transformative entrepreneurship. Second, it illustrates how these key factors may be utilized together in one learning model reinforcing the learning and transformative effect.*

**Keywords:** *entrepreneurial mindset, transformational entrepreneurship, learning circles, entrepreneurial learning process*

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## INTRODUCTION

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This paper addresses the problem of developing entrepreneurial mindsets for enhancing transformational entrepreneurship. Given the challenges of globalization, aging populations, increasing migration, and increasing disparity between the rich and the poor, countries and governments are searching for solutions that can produce a positive impact on socio-economic development. One of the proposed solutions relates to promoting transformational entrepreneurship in regions across the world (Ratten & Jones, 2018; Maas, Jones, & Lockyer, 2016).

The concept of transformational entrepreneurship is still in its infancy. According to Miller and Collier (2010, p. 85), transformational entrepreneurship “transcends economic terms and emphasizes the centrality and value of people, their vocations, and the many levels of relationality involved in entrepreneurship, in addition to the technical aspects of the business.” It is based on the principles of supporting the interconnectedness of people and environments to facilitate adaptation and transformation through change, as well as decision-making in the conditions of uncertainty. By encompassing sustainable practices it may provide an impact on society through creative solutions that enable change and maximize economic and long-term societal impact (Ratten & Jones, 2018). In this paper, transformational entrepreneurship is understood as a purposeful action and a capability of bringing about changes in the life of an individual (entrepreneur) and in the organization where an individual is involved by contributing towards “global societal changes that involve the emergence of a new qualitative dimension of possibilities and conditions” (Staffas, 2017, p. 19). Meanwhile, entrepreneurship means initiating something new; transformational entrepreneurship refers to engaging in actions that “involve movements and creations in an entirely new dimension” (ibid.).

Entrepreneurship can be understood in terms of a particular type of *mindset* (McGrath & MacMillan, 2000) that can be developed through higher education programs, lifelong learning settings, and vocational training (Kakouris, 2015). Lamberton, 2005, p. 162 defines mindset as a “habitual or characteristic mental attitude that determines how you will interpret and respond to situations.” Täks, Tynjälä, and Kukemelk (2016) suggest that an entrepreneurial mindset is related to such skills as the ability to identify opportunities, creative problem-solving, strategic thinking, networking, life-long learning, resilience to failures and decision-making in the situation of uncertainty.

Worldwide educators are preoccupied with educational programs that would assist in developing the skills of seeking and seizing opportunities inherent to entrepreneurial mindsets (Oyugi, 2015; Leon, 2017). However,

the general consensus is that traditional pedagogical approaches are “insufficient to adequately develop entrepreneurs,” and there is a growing need to “cultivate innovative ways of thinking ... to fully enhance and develop entrepreneurial approaches to education and learning” (Higgins, Smith, & Mirza, 2013, p. 135). Acknowledging the need for novel approaches that would promote entrepreneurial thinking and mindset, along with the importance of transformational entrepreneurship for local and regional development (Maas, Jones, & Lockyer, 2016) this paper addresses the following question: What learning processes promote the development of entrepreneurial mindsets for transformational entrepreneurship?

In order to answer this question, the paper presents a case study of an adult learning model called Transformative Learning Circles (TLC). The TLC model was elaborated by the Nordic Network for Adult Learning (NVL) with the support of the Nordic Council of Ministers for the purpose of promoting transformational entrepreneurship. The overall learning objective of the TLC model was to promote the integration of an entrepreneurial mindset as part of the individual’s work activity and as an embedded cultural element in different social and organizational contexts. The pilot project of the TLC model was carried out in 2015–2017 in the Nordic setting including five countries: Denmark, Sweden, Norway, Finland, and Iceland. To answer the question of interest, this paper addresses the learning processes within the TLC model and discusses how they promote entrepreneurial mindsets for transformational entrepreneurship.

The findings suggest that learning which promotes transformational entrepreneurial mindsets occurs in a dynamic iterative loop where individual level learning is combined with knowledge-sharing and interaction at the group level. Three particular phases can be distinguished within the learning processes: 1) framing the praxis; 2) amplifying the frame of reference; and 3) reinterpreting the praxis. Furthermore, learning occurs as a result of instances that permit knowledge conversion between its tacit and explicit modes. The effect of the TLC learning processes on enhancing entrepreneurial mindsets for transformational entrepreneurship is illustrated in terms of learning outcomes.

The paper has the following structure. The next section provides an overview of the literature on entrepreneurial learning. The paper then describes the research method and introduces the case study of the TLC learning model. The following section presents the findings of the study describing three phases of the learning processes. The section is closed by proposing a conceptual model for the development of an entrepreneurial mindset for transformational entrepreneurship. Finally, the paper offers a conclusion highlighting theoretical and practical implications of this research.

## LITERATURE REVIEW

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### Preconditions for fostering an entrepreneurial mindset

The overview of the literature on entrepreneurial learning and education suggests several important factors for the development of entrepreneurial thinking and mindset that are considered in this section in more detail.

First, the nature of entrepreneurial learning is, to a large degree, experiential (Krueger, 2007; Kolb, 2014; Kakouris, 2015). This corresponds with the literature on experiential education. Particularly, learning occurs through experience from an interaction with a process and then transferring this experience into a new context/situation (Dewey, 1986). Knowledge is a set of experiences, but only by making use of and engaging in practice do we derive meaning and value from these experiences. However, experiential learning is not complete until it extends to a deeper cognitive reflexive learning (e.g., Higgins & Elliott, 2011; Pittaway & Thorpe, 2012; Fayolle, Pittaway, Politis, & Toutain, 2014). Therefore, critical reflective practice is important for fostering the development of entrepreneurial mindsets (Higgins, Smith, & Mirza, 2013; Kakouris, 2015; Lindh & Thorgren, 2016; Tikkamäki, Heikkilä, & Ainasoja, 2016).

One of the ways to trigger the reflective process is by employing the principle of learning from critical events (or critical incidents) – a notion loaned from the cognitive psychology literature. Critical events refer to unexpected events that disturb the normal course of activity. Such events become triggers for reflection as they prompt humans to combine previous experiences and new ideas while reconsidering existing thoughts and actions (e.g., Woods, 2012). Scholars have emphasized the role of critical events for entrepreneurial learning and, in particular, learning how to deal with risk and uncertainty (e.g., Cope & Watts, 2000). In the research literature, critical events were presented as inalienable parts of entrepreneurial learning (Kolb, 2015; Lindh & Thorgren, 2016). Lindh and Thorgren (2016) argue that in order to develop an entrepreneurial mindset, one should possess an ability to recognize which events are critical to reflect upon and take action. Furthermore, for critical events to be useful for developing entrepreneurial thinking, learners must “recognize and define their thoughts, emotions and behaviors, and relate them to different conditions and judge them in relation to entrepreneurial determinants” (ibid., p. 538). Reflective learning does not start with the experience of a critical event, but with the ability to recognize such an event (ibid.). In this connection, authors suggest that critical event recognition should be addressed in teaching efforts including training entrepreneurs to detect their own thoughts, emotions, and behavior in different situations. The difference in cognitive preparation might provide

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an explanation of why some individuals learn from failures and unexpected events, whereas others don't.

Even though the critical incidents approach is recognized as useful in entrepreneurial learning, some scholars argue that it does not go far enough in aiding people to learn in a more reflexive manner (Higgins, Smith, & Mirza, 2013). In order to develop reflexive awareness, entrepreneurial learning should make use of reflexive critiques. Reflexivity implies questioning one's own practice and assumptions (ibid.). Furthermore, experiential learning yields its fruits when it is triggered by reflection upon one's own learning experiences (Cope, 2003). This is in line with the notion of self-critical reflection described by Mezirow, 1991 who connected learning with developmental educational psychology. Self-critical reflection denotes the ability to dispute one's own assumptions and stereotypes, "a uniquely adult form of metacognitive reasoning" (Mezirow, 2003). Metacognition refers to thinking about one's own thoughts and self-reflection about one's own reasoning, which is concerned with the validity of one's own thinking (Kakouris, 2015). The literature sees metacognition as a dynamic learned response that can be enhanced through training (Haynie, Shepherd, Mosakowski, & Earley, 2010; Liang, Lee, & Liang, 2015).

Reflecting on events or breakdowns in the practice of an entrepreneur may lead to "transformative learning" (Cope, 2003; Taylor & Thorpe, 2004). The concept of transformative learning was first introduced by Mezirow (1978) within the context of adult education. Mezirow defined transformative learning as "the process by which we transform problematic frames of reference (mindsets, habits of mind, meaning perspectives)—sets of assumption and expectation—to make them more inclusive, discriminating, open, reflective, and emotionally able to change. Such frames are better because they are more likely to generate beliefs and opinions that will prove more true or justified to guide action" (Mezirow, 2009, p. 92). Transformative learning theory implies a metacognitive assessment of instrumental and communicative reasoning that comprises two aspects: critical (self-) reflection on assumptions and participation in dialog to ensure the best reflective judgment. To summarize the second point, an entrepreneurial mindset is metacognitive in nature, and therefore inclusion of metacognitive training in entrepreneurship pedagogy fosters entrepreneurial thinking (Haynie, Shepherd, Mosakowski, & Earley, 2010).

Finally, developing entrepreneurial thinking is a process of co-creation in human interaction involving both educator and learner who co-construct learning experiences (Higgins, Smith, & Mirza, 2013). This understanding is in line with the assumptions of the social constructionism paradigm. According to the reflexive pedagogy approach, entrepreneurial learning is an enacted product of experience which comes through interactions with others who

have different ideas (ibid.). Educators and learners actively participate and engage in creating new ideas by reflecting critically on their current practices. The contradiction of opinions might cause a person to question their own usual practices and start seeking alternative ways. Entrepreneurial learning here is a relational practice in which shared meanings are created through reflexive questioning, critiquing, and challenging the current state of things.

To summarize, experiential learning, critical events recognition, reflexivity and metacognition, transformative learning, and co-creation of learning experiences are all important factors and principles for developing an entrepreneurial mindset. However, even though these factors are known, it is their unique combination that might produce a difference for the entrepreneurial learning enabling transformation. The following sections address in more detail, how the TLC model combined the above-mentioned factors in a way to facilitate learning processes for fostering an entrepreneurial mindset and achieving change at the individual and organizational level.

## RESEARCH METHODS

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The research data was collected by a team of eight Nordic researchers as a part of the evaluation of the TLC pilot project (Staffas, 2017). The exploratory study was partially guided by Reason and Rowan's (1981) human inquiry paradigm emphasizing the importance of involving all relevant actors in the research process. The principles central to this approach suggest that all the involved actors can contribute to deciding what to look at, the methods of inquiry, and making sense of the findings. While carrying out the study, the data collectors sought to maintain a critical distance by minimizing their influence on the implementation of the pilot TLC project. The data collection took place between August 2016 and March 2017. A mixed-method approach was adopted in order to obtain a deep understanding of the TLC model, its implementation, and learning processes. In particular, data were collected through individual interviews with the TLC participants and facilitators (11 in number), focus group discussions (5), analysis of the logs which TLC participants filled in, observation of the TLC circle meetings, informal conversations with the TLC participants, and a final survey. The semi-structured open-ended interviews and focus group discussions varied between 45 and 70 minutes and were tape-recorded and transcribed for the purposes of analysis. Most interviews were conducted in English, but Swedish, Norwegian, and Danish were also used. Observation of the physical and digital TLC meetings gave a better insight into the dynamics of the learning circles. The individual logs provided a wealth of information to support the data granted from the individual interviews.

Informal conversations with the TLC participants improved understanding of the learning needs, processes, and outcomes. Finally, 12 participants provided their answers to the questions of the anonymous final survey.

To secure credibility of the study—that is, accuracy of understanding, interpretation, and representation of the research results (Ritchie, Lewis, Nicholls, & Ormston, 2013; Lincoln & Guba, 1985)—several measures were taken. In order to obtain credibility of understanding in the phase of data collection, multiple sources of evidence were used; in other words, the method of triangulation was employed (Ghauri & Grønhaug, 2005). Credibility of interpretation was enhanced through theory triangulation (Ritchie, Lewis, Nicholls, & Ormston, 2013) by looking at empirical data from different theoretical perspectives. In order to verify the findings and provide a sensible representation of the information obtained, the preliminary findings were presented to the circle participants in a physical meeting where the feedback from the participants was obtained. In this way, data, analytic categories, and interpretations were tested with the respondents from whom the data was originally obtained—a validation technique known as member check (Lincoln & Guba, 1985). Finally, credibility of representation was secured by using citations from the interviews and focus group discussions with the respondents, whose identity is kept anonymous.

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## **ANALYSIS, STUDY AND RESULTS**

### **The case of the Transformative Learning Circles**

#### ***The TLC learning model***

Transformative Learning Circles is an adult learning model that was developed by Nordic Network for Adult Learning (NVL)—a network for entrepreneurial learning and innovation, with the financial support of the Nordic Council of Ministers. Two core elements lie at the heart of the model: learning circles and a log system identifying critical incidents. The notion of the learning circles refers to a non-formal and purposeful approach to adult education where a group of people comes together to investigate an issue of common interest. This usually includes initial planning and a series of meetings with specific goals that members of the circle wish to achieve during the meetings. It is suggested that learning circles allow participants to focus learning upon their own practice and encourage them to act “as critical investigators promoting dialogue and collaborative inquiry” (Ravensbergen & Vanderplaat, 2010, p. 340). Further, the problem-solving approach pertinent to the learning

circles “awakes” critical consciousness or critical reflection and enhances the sharing and use of participants’ skills and experience (ibid.).

For the pilot project, three learning circles were established. In total, 25 people participated in the pilot TLC project, 12 male and 13 female participants, aged 25 to 60 years. All participants hold working positions in the private or public organizations representing different sectors. Circle participants originated from five Nordic countries: Norway, Sweden, Denmark, Finland, and Iceland. These were practitioners with diverse professional backgrounds in consulting, research, public service, and the educational sector. Participants represented a mix of actual entrepreneurs owning their own firm (for example, occupied with coaching, training, consultancy), and practitioners employed by different organizations (for example, in the university sector or public service).

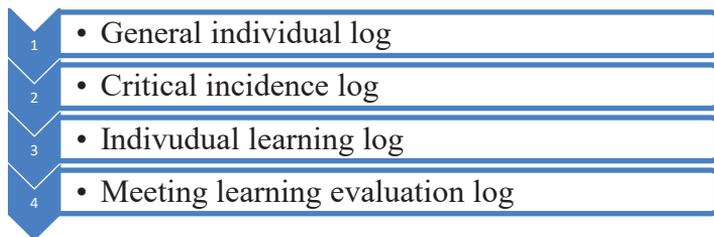
The circles were organized around three major themes: (1) entrepreneurial learning and innovation in education (7 participants); (2) entrepreneurial learning and rehabilitation in workplaces (10 participants); and (3) entrepreneurial learning and integration (8 participants). The first circle consisted of educational and pedagogic experts. The second circle encompassed consultants, academics and public servants working with innovation and networks. The third circle included social workers and daycare personnel who worked with newcomers and immigrants and their inclusion in Nordic countries. The participants for each circle were chosen by the circle leaders (facilitators) based on individual acquaintance and connection to the NVL. National and professional diversity was seen as an important precondition of the TLC model, a factor that could increase the potential for learning. The common feature of the TLC members was interest in entrepreneurial learning, promoting innovation, and active participation and involvement in the TLC program.

According to the TLC model, the participants were engaged in two types of activities over a 9-month period: participating in the circle meetings (physical and digital) and keeping the logs. The kick-off for the circles took place in May 2016 in Västerås, Sweden. The second round of circle meetings was held the same year in Norway. The participants of one circle met in August in Elverum, while the two other circles met in October in Hamar. The third round of circle meetings took place in January 2017 in Uppsala, Sweden. These particular places were chosen on the basis of convenience and availability of the facilities to host the circle meetings. The length of the physical meetings varied between one and two days. In between physical circle meetings the participants arranged digital meetings via Skype to discuss the interim progress, reflect on the physical meetings, and suggest improvements in order to achieve the best possible learning environment. Each circle decided itself the frequency and

agenda of these Skype meetings. On average, the circles met on Skype one to two times in between physical meetings.

### ***The log system***

Each participant of the TLC had his/her own development/work project with which he/she was preoccupied professionally. The log system was used to document activities, experiences, and reflections related to individual development projects. Circle participants were expected to keep the logs in between physical meetings. The logs were set up in a matrix system according to the following logic. Each participant was to keep a general individual log book, from which they would extrapolate a critical incident log, and further formulate an individual learning log (Figure 1).



**Figure 1.** The log system

The general individual log draws on the Guiding Principles—key questions and indicators of transformation (see Attachment 1). The Guiding Principles were elaborated as a part of the model assuming that transformative action can be derived from a guiding principle and that the transformative quality of the action taken can be verified by an indicator of transformation (Namdar, 2016). In this log, participants could reflect on their own actions, and attempts that would foster change in themselves or in their organizations.

In the critical incidence log, participants could register critical events associated with individual or organizational transformation. Critical incidents could be actions, thoughts, or events that had happened and made a transformative impact on the person who reported them.

The TLC participants used individual learning logs to document what they wanted to share during the next circle meeting. One critical incident was to be chosen from the individual log book, followed by an analysis of what the person and/or her working place had learned.

Finally, during the circle meetings, the meeting learning evaluation log was to be filled out by the circle facilitator with the assistance of the circle

participants. For this log, each participant could choose one particularly interesting aspect of the learning process taking place during the circle meeting which would benefit from further development.

The log system was thus designed to seize learning experiences, reflections, and outcomes at the individual and group level (see Attachment 2 for the illustration of the log system).

### ***Facilitation in the TLC***

The purpose of facilitation was in line with the overall purpose of the TLC model—that is, helping a group of people to discover new modes of thinking and acting that would cause transformation at the individual, group, or organizational level. The circle leaders were assigned the role of facilitators and therefore needed to have knowledge of adult learning and facilitating methods. The facilitators played a double role in the TLC model; in being both facilitators and participants, they were charged with finding a balance between these two roles. For the purposes of transformative learning, it was important to create and maintain an atmosphere of trust and support in the learning environment. Facilitators, who were to encourage others (and themselves) to challenge habitual ways of thinking and acting, were to send the signals that would promote openness, mutual respect, and tolerance (Ndlela, Hole, Sletli, Haave, Mei, Lundesgaard, Hermanrud, Staffas, & Namdar, 2019).

The work of facilitation was organized in a three-step cycle structure: before, during, and after the circle meetings. In the time preceding the circle meeting, facilitators were to prepare for the circle work by reading the members' logs, in particular, the critical incidents logs, in order to highlight themes for discussion. In addition, facilitators invited group members to contribute to the agenda of the next circle meetings.

During the circle meetings, facilitation was carried out through the use of various tools and methods for conversations and knowledge sharing. In some circles, facilitators could bring in their own critical incidents to trigger the discussions. The work of the circles followed the logic of deliberative discussion (Burkhalter, Gastil, & Kelshaw, 2002) where the central elements were dialogue, questioning, and active engagement (Stein, 2009). At the end of the meeting, facilitators were responsible for facilitating an evaluation of the learning process that took place during the meeting.

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## DISCUSSION

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### The TLC learning processes and their characteristics

The process of learning in the TLC took place as a dynamic iterative loop in the interplay between individual and collective domains. While analyzing the implementation of the TLC model, three concrete phases of transformative learning can be distinguished:

- 1) Framing the praxis.
- 2) Re-framing: amplifying the frame of reference.
- 3) Reinterpreting the praxis.

The notion of praxis implies the manner in which people are engaged in the world and with others (Ramsey & Miller, 2003). The phases of the learning process facilitating the development of entrepreneurial thinking and mindset are summarized in Table 1, which can be read as follows. Three phases of learning process are described based on several dimensions. The first dimension refers to the individual vs collective domain of learning. The second dimension reflects the mode of knowledge conversion – between tacit and explicit (Nonaka & von Krogh, 2009). The third dimension describes learning practices of the TLC model at each phase of learning. The fourth dimension refers to the key theoretical concepts that explain the core of each learning phase. Finally, some examples of the TLC participants' survey feedback support and illustrate the learning processes at each phase. A more detailed description of each phase is provided below.

#### ***Phase 1. Framing the praxis***

As part of the preparation for the circle meetings, the participants were engaged in filling in the general log and extrapolating critical incidents followed by the individual learning log. The logging was supposed to be related to the circle participants' individual development projects. This task involved a lot of comprehension work where the participants made efforts to project the work practice against the theory of guiding principles—in other words, to frame their own praxis. This implied converting the tacit knowledge of everyday work practice into explicit statements specified through guiding principles and transformation indicators. Several TLC participants described logging as a good tool for reflection:

“Definitely the time to reflect. To sit down and think why things became the way they did and how my acts influenced the process. Filling out the logs was important for establishing this deep reflection” (TLC participant, final survey).

**Table 1.** Development of an entrepreneurial mindset in the course of TLC: Phases of the learning process

Phase	Framing the praxis	Amplifying frame of reference	Reinterpreting the praxis
Level/domain	Individual	Collective	Individual
Knowledge conversion mode	Tacit → explicit	Explicit → explicit Tacit → explicit	Explicit → tacit
Learning Practice of TLC	Individual work with the learning logs (praxis to theory) Analyzing & structuring practice against given theoretical framework Sense-making Specifying critical incidents	→ Physical circle meeting with other members  Discussions based on individual projects, logs & critical incidents via questioning, commenting, challenging, advising, visualizing, colliding viewpoints.	→ Individual work with development projects (theory to praxis)  Post-meeting individual self-reflection, interpretation, correction & re-consideration
Key concepts and references	Critical event thinking (e.g., Cope, 2003; Cope & Watts, 2000)	→ Co-creation (e.g., Higgins, Smith & Mirza, 2013)	→ Metacognition: reflection on the process of one's own learning (e.g., Mezirow, 1991, 2003)
Examples of the feedback from the TLC participants	<p>"The log is a good tool for reflection and when I got it done, it gave many good considerations and made me aware of new knowledge and input."</p> <p>"After a while log-writing turned into a tool for reflection that was very good for me."</p> <p>"Log-writing opens up for new recognitions, and in the descriptions of critical incidents, one gets a view of the many different meanings and consequences."</p>	<p>"We developed the frame for the work in the circle together. Every participant brought their practice challenge and we used the guiding principles in the logs as far as possible to structure our meetings."</p> <p>"Learning dialogues, where others in the group gave feedback on a dilemma that led to new insights."</p> <p>"Many good brainstorming sessions with skilled people with new perspectives. Informal but serious tone with a lot of humor"</p> <p>"For me, the belief and knowledge that the group collectively owns the answers has become clearer. To dare to rely on that the knowledge is among the members of the group"</p> <p>"Dynamic teamwork that challenged my general understanding and often led to new ideas and transformative solutions."</p>	<p>"My most important learning is that a long-term, structured and systematic process of reflection opens new perspectives to one's own access to problem-solving capacity in one's own practice."</p> <p>"The most important aspect of my individual learning was that I had to make my own reflection work both before and after each meeting."</p> <p>"I think I have become better at listening to others and I am no longer so focused on reaching my goals. I have become more aware about the importance and that the end goal gets better when everybody is involved"</p>

At times, reflexive work behind the log activity was more important than filling in the logs: it helped to understand sequences of critical events and their consequences. Framing the praxis by filling out the logs provided participants with a deeper meaning of their everyday work situations and understanding of the multiple meanings:

“The log-writing has been a good experience for me... Through the log-writing, I realized the relation between different activities that I am involved with... Log-writing opens up for new recognitions, and in the descriptions of critical incidents, one gets a view of the many different meanings and consequences which this experience can bring for the future work” (TLC participant, interview).

Since the logs were to be used in the circle discussions, the participants sought to make them meaningful both for themselves and the others:

“Also, the balance between too general and too specific... Because it can be very long with a lot of bunch of details that are not important for others to read, but it can also be so short that it’s too general so, as a matter of fact I could just cut and paste what you have written to my own log because it’s so general that it just fits. So I think that’s, we need to find balance in how detail we are and how general we are. But I think for me, at least, it has been very reflective – self-reflective to fill up these logs” (TLC participant, focus group).

Logging was a challenging task in terms of time used and effort to understand the system and logic of logging, the logic of guiding principles, and recording events/critical incidents in a meaningful manner. Because of these challenges, some of the participants reduced individual logging to critical incidents only. Some of the participants experienced logging as a twofold activity, first by recording the “data” concerning their own praxis. This “data” was mostly seen as the source of information and learning for other circle participants. Second, the participants engaged in “learning” from their own records. This entailed individual, personal learning from their praxis. The participants learned that these two functions of the logs were somewhat at odds with each other, posing a challenge for framing their praxis in a way that was meaningful for everybody.

## ***Phase 2. Amplifying frame of reference***

The way circle meetings were organized, the learning environment, the facilitation mode, and co-construction of solutions created possibilities for the participants to amplify their own frame of reference and approach their individual development projects in more mindful and reflexive ways.

Circle meetings were important as the places for developing new ideas and approaches. The collective domain provided the impulse necessary to stimulate individual learning. The participants were sure that “the energy was in the group.” The interaction of participants during the circle meetings made them “feel brave, get energy, challenge themselves, and get strength for the development work.”

The circle participants belonged to the same type of context or work setting (for example, higher education) and yet had different challenges. In the beginning of the circle work, one of the participants would start with presenting his/her development project and logs or critical incident. Further, all circle members would receive an invitation to participate in the discussion. The discussion included questioning and commenting, challenging opinions and advising, visualizing, and presenting colliding viewpoints:

“When I read something in a book, for example, it makes sense to me that oh, I should do this and this and this makes sense or something like that. But when we talk about it in this circle, the other participant’s challenge what has been written ... it gives me another reflective level than just, just ... reading, you know a book” (TLC participant, focus group).

“And you all bring lots of new value to my thinking because you say things that I wouldn’t necessarily think by myself ... I think there’s diversity in it, I think I learn when I speak and I learn when I listen. And I think there’s a high level of reflection—but you have to learn that” (TLC participant, focus group).

Participants were enthusiastic in discussing and sharing their opinions and asked critical, challenging, and reflective questions. The learning environment was characterized by participants themselves as an environment facilitating “trust, curiosity, understanding, open discussions, and challenging questions” and was safe enough to raise disagreements.

When listening to the presenter’s case, the circle participants could advise with reference to their own experience. The logs were actively used in the process of learning and sharing experiences of the circle participants:

“...we went through my log actually today. How did I fill it out, what was missing, what was, what did I mean when I wrote it down and so on and that gave me again another reflection...” (TLC participant, focus group).

Participants often attempted to visualize their problems, challenges, and solutions in models, drawings, and pictures. In general, learning in the TLC circle meetings was a joint process of co-creation where every circle member contributed with his/her comments, ideas, remarks, experiences, questions, etc.

The above-described arrangement of circle meetings permitted the amplification of participants' frame of reference—that is, to expand their understanding of the phenomenon in question by encompassing new perspectives and viewpoints. This reframing shows, for example, in understanding the need for “getting outside one’s own perspective, and trying on different roles” when solving the challenge of the development project or seeing the need to “be more reflective at the personal level” (from the Meeting Evaluation Log).

From the point of knowledge sharing, the reframing was activated when the participants were sharing both the tacit knowledge of personal experience and explicit knowledge codified in the logs and transforming it into the explicit knowledge shared by all circle participants.

At the individual level, for some participants, the process of reframing resulted in an understanding of “the need to see one’s own development project in a wider perspective and taking a step back to change it.” For other participants, it was important to “focus on what happened as a result of the way” the person worked. For the third, the challenge was to “see bigger processes behind” their expert area (citations from the Meeting Evaluation Log).

### ***Phase 3. Reinterpreting praxis***

The third phase of the TLC learning processes can be described as circle participants reinterpreting their own praxis. In between the circle meetings, the individuals were engaged in interpretation of what they discussed at the circle-meeting, re-consideration of their old ways and approaches, and further search and correction to use the new ones.

Upon coming back home from the TLC circle work, the participants returned to their customary work tasks and the practice of development projects:

“And this is also a great opportunity to take something that we face on a daily basis out of that context and bring it here like a totally new environment and evaluate it ... maybe I have thought about this in a totally different way or a wrong way, and then bring it back to the daily context and see if something is different” (TLC participant, focus group).

To make sure the individual learning took place, it was important (and challenging) to connect the energy and reflection in the circle meetings with the individual and the development projects at home which took place between the circle meetings. In other words, the task was to convert the explicit knowledge gained at the circle meetings into the tacit knowledge of the new work practice. The participants were aware that this step required

their motivation, will, and commitment, as well as empowerment—the possibility to produce change in their organizations:

“If ... you wouldn’t have permission from your organization to change anything at organizational level, but still, you can make the change in personal level. And, there’s some kind of value in that too, so when maybe you realize that you’re not working in the right organization and you want to change your life” (TLC participant, focus group).

Reinterpreting the praxis included not only the amplification of one’s own knowledge by encompassing new perspectives, but also metacognitive thinking implying reflection on one’s own learning. In this way, the TLC promoted the development of metacognitive skills—the skills critical for an entrepreneurial mindset (Haynie, Shepherd, Mosakowski & Earley, 2010, Cho & Jung, 2014):

“The most important aspect of my individual learning was that I had to make my own reflection work both before and after each meeting” (TLC participant, survey).

“My most important learning is that a long-term, structured and systematic process of reflection opens new perspectives to one’s own access to problem-solving capacity in one’s own practice” (TLC participant, survey).

The nature of learning in the TLC can be described as additive, gradual, and incremental. According to the participants, it was not the revolutionary new knowledge they returned home with. Rather, it was “reasoning” that occurred as a result of meeting and interacting with peers. The participants experienced their learning as a process of “taking a little step further in their knowledge.” Referring to the TLC participants, in their work-life, they tried to make this little step forward in everyday praxis.

### **Learning outcomes and change effect in the TLC**

The TLC participants expressed that participating in the TLC helped them to create a space for reflection—a rare opportunity in their busy lives. In this space, they could reflect about possibilities for their project development (reflection on practice) while interacting with their peers (reflection in practice):

“TLC isn’t only about learning from experiences and learning from mistakes. You don’t learn without reflection, you have to go deeper in your search for answers” (TLC participant).

Moreover, this space permitted reflection about their own learning process. For instance, the participants reported that because of participation in the TLC, they started reflecting on the choices they made and personal habits, including their own mindset and behavior. The TLC provided a liberating context for reflection on individual roles and interests.

“It is exactly that one reflects not only on the technical level of learning but also about one’s own role and interest within the context which also has strong liberating qualities ... One opens up for several possible roles and resources” (TLC participant).

Part of the individual learning process involved something the participants referred to as “unlearning.” In order to learn and act in the new ways, the TLC participants recognized the importance of “unlearning” their customary roles. Getting rid of professional masks, encompassing ease and “playfulness” was a significant part of the learning process having impact on embracing new ideas and creativity.

“When one works a lot with people who are decision makers in different authorities, then it’s not always fruitful to sit around such a table like this: then it’s very much “I wear this jacket,” and my role is so. In this case, one may actually need to take out that role and provoke playfulness” (TLC participant).

Learning at the personal level in the TLC took place in terms of seeing things in a different light and intensifying reflexive practice that brought intrapersonal change and change in patterns of behavior. To illustrate this, some examples of the individual learning outcomes are provided below:

- a TLC participant said that due to the TLC work, he had changed towards being more tolerant;
- a TLC participant mentioned that he had learned a lot about himself. Furthermore, he felt that he had become braver and had improved his working methods;
- a TLC participant expressed that she became more curious about her own practice, as well as that of her colleagues. The result was “seeing things differently and seeing new things”;
- a TLC facilitator recognized that because of participation in the TLC and working with logs and critical incidents, he became more aware of the “critical incident thinking.” This included, for example, how the individual learning curve may change based on the choice of the critical incident. The facilitator said that he reflected on a number of questions—for example: Is the critical incident really a critical one, and at what point of time? How does the choice of the critical incident affect future learning and practice? Is one able to manage the process of one’s own learning? In this way, meta-reflection on

one's own learning took place. Further, the facilitator was engaged in reflections about his personal behavior. This resulted in changing the pattern of his communication with colleagues. Thus, meta-reflection on one's own practice led to changes at the personal level.

The intended purpose of the TLC model was to promote the development of an entrepreneurial mindset for transformational entrepreneurship with the outcomes both at the personal and organizational levels. The study of the pilot TLC project suggested multiple pieces of evidence of such development at a personal level. Further, the study also provides some examples of transformational entrepreneurial behavior at the organizational level.

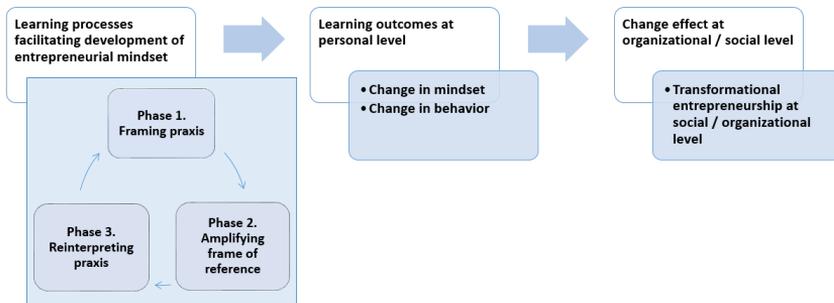
The first example concerns the adoption of the log system in the entrepreneurship course taught by one of the TLC participants at his home academy. The TLC participant not only adopted the log system for his course but also modified it. He simplified the complex system of logs located in several word documents into one electronic log which he made available for the students as a mobile application. The TLC participants commented that the original log system was quite challenging both in terms of understanding and use. The above-mentioned participant took into consideration his own user experience of the log system as well as comments of the peers and transformed it into a more user-friendly and easily-accessible electronic version. He did so while preserving the core of the log system—the guiding principles and the critical event recognition. The result of this modification—an electronic version of the log system which was used by the entrepreneurship students—was presented to the delight of all TLC participants at the final TLC evaluation meeting. Implying that “entrepreneurial behavior that goes beyond current expectations” is considered to be transformational (Ratten & Jones, 2018, p. 4), this example presents an indication of social transformational entrepreneurship with the effect on the organizational level.

Another participant reported how the individual perception of his own professional abilities was changed as a result of the TLC, and how this change in mindset influenced his entrepreneurial activity at his work place:

“One of the most important learning and understanding that developed in me... was that I'm (now) capable to work with international professional education group, and that my know-how can be applied with multicultural environments with other professional fellow colleagues and people who work with education. I see this as a critical part of my developing professional identity. I feel that without our group and TLC as a format, this development would have taken much more time to happen. Or it could be possible that I would have never taken the step forward with starting to cooperate with this depth with multicultural groups. After experiencing TLC, I have had the

courage to mentor and coach multicultural groups in my university of applied sciences. I will take responsibility to create new six-month entrepreneurship side subject for multicultural student group, and I actively search new opportunities to collaborate with new partners in different countries. This is something I feel is the most valuable that I got out of the TLC. This is something for me personally, but also for the organization I work in” (TLC participant, individual interview). With reference to the examples above, the study of the TLC pilot project provides evidence of the TLC participants developing an entrepreneurial mindset resulting in a learning and change effect both at the personal and social/organizational level. In the context of this study, the change efforts undertaken by the TLC participants at the organizational and social levels constituted the essence of transformational entrepreneurship.

The findings of the study and the discussion above can be summarized in a conceptual model for the development of an entrepreneurial mindset for transformational entrepreneurship (see Figure 2). According to this model, the learning processes facilitating the development of an entrepreneurial mindset include three phases: framing the praxis, amplification of one’s own frame of reference, and reinterpretation of praxis. Once this sequence is achieved, the immediate learning outcomes can result in a change of mindset and behavior at the individual level. Further, this personal change may lead to transformational entrepreneurial behavior at the social/organizational level.



**Figure 2.** Conceptual model for the development of an entrepreneurial mindset for transformational entrepreneurship

## CONCLUSION

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Drawing on the study of the TLC adult learning model, the paper set out to explore the learning processes facilitating the development of an entrepreneurial mindset for achieving transformational entrepreneurship. The findings reveal that such learning processes include three phases: framing the praxis, amplifying the frame of reference, and reinterpreting the praxis.

Framing the praxis was enforced by filling in the logs and critical event recognition. It is argued that reflective entrepreneurial learning starts with the ability to recognize a critical event (Cope & Watts, 2000; Lindh & Thorgren, 2016). The study suggests that projecting the work practice against entrepreneurial theory in the log system and extracting critical incidents triggered reflective processes among the TLC participants. This type of exercise assists entrepreneurs to recognize the events they should react to and learn from (*ibid.*).

Amplifying the frame of reference was triggered by collective discussions in the circles employing the logic of co-creation (e.g., Higgins, Smith, & Mirza, 2013). In the TLC case, learning experiences were co-constructed with peers and facilitators through advising, reflexive questioning, challenging, and colliding viewpoints. Being exposed to different perspectives and ideas, the entrepreneurs started querying their practice and saw the need to explore alternative ways and options.

Finally, a reinterpretation of one's own praxis occurred while connecting the results of the circle meetings to the individual development projects. At this point, the participants were challenged to re-interpret, re-consider, self-assess, and, if necessary, correct the practice to produce a change. The combination of participatory dialogue and critical reflection (Mezirow, 2009) provided the metacognitive training necessary for transformative learning and the development of entrepreneurial thinking.

The contribution of this study to the literature on entrepreneurial learning is twofold. First, it explains how the key factors influencing entrepreneurial learning are connected to concrete learning processes facilitating the development of an entrepreneurial mindset for transformative entrepreneurship. Likewise, critical events recognition and logging assist to frame the individual's praxis by projecting their everyday work life through the lens of entrepreneurial theory. Co-creation of learning experiences helped to amplify the individual's frame of reference by embracing new ideas and perspectives in a more mindful way. Reinterpreting their own business practice by connecting group discussions to their own development projects triggered metacognitive thinking – a reflection on one's own learning.

Furthermore, the three learning processes embrace the principles of experiential and transformative learning. The second contribution of the study is that it illustrates how these key factors may be utilized together in one learning model reinforcing the learning and transformative effect. According to Pittaway and Thorpe (2012) for effective entrepreneurial learning to take place, action must be followed by a high-level reflection. The study of the TLC exemplified how action and reflection may be organized in a loop through the three-phase learning process.

It is suggested that transformational entrepreneurship would be more acceptable and endorsed in the societies supporting participatory, human-oriented, team-oriented leadership styles (Ratten & Jones, 2018). Even more so this concerns the learning setting that facilitates entrepreneurial mindsets for such entrepreneurship—setting that is participatory, democratic, facilitating individual and co-creative efforts. Speaking about learning outcomes and change effects, this study suggests that transformational entrepreneurship relates to transformations not only in value-creation activities but also in attitudes and behaviors.

The TLC model described in this study is not unproblematic, implying that the design of the model and its implementation posed certain challenges. Likewise, working with logs posed semantic and interpretational challenges: Is the log too general or too specific? Does it make sense for other participants? How to choose a critical incident? Technical challenges with the logs were connected to their complexity and dispersion in several text documents. Physical circle meetings presented another set of challenges, among which were language barriers (in some circles), securing equal participation of the circle members, and encouraging knowledge sharing (the facilitation function). Finally, while working with the individual development projects in between the circle meetings, participants could experience institutional barriers and lack of empowerment at the organizational level, as well as bounded individual cognition at a personal level. Therefore, educators preoccupied with the development of complex learning models, such as TLC, should be aware of the barriers and challenges similar to those described above, and try to address these concerns at the design stage.

While the model addressed in this study has a potential for further testing in other national, cultural, and educational settings, the three phases of the learning processes are what is to be taken further to embrace in educational and pedagogical practice for fostering transformational entrepreneurship.

The study of the TLC learning model provides some interesting implications for practice. First, the TLC model is essentially a “Nordic product” embracing the Nordic traditions for learning based on high involvement, participatory design and shared responsibility for learning. This differs from

a top-down approach to learning where the educator or the course leader is the primary facilitator and carrier of knowledge. With the possibility of being integrated with different educational settings, the TLC model promotes broad participation where the learners act as active co-constructors of the learning processes. Second, the pilot implementation of the TLC model involved participants across different countries, cultures, educational backgrounds, professional experiences, organizations, and sectors. This diversity proved to contribute positively to the learning outcomes and transformational effect at the individual and organizational levels. It is therefore suggested here that there is a big potential to employ this model in the international settings charged with developing entrepreneurial and innovative thinking and elaborating solutions for complex social and organizational problems.

This piece of research supports Lindh & Thorgren, 2016 who argue that entrepreneurial training should be designed in a way to promote participants' ability to recognize the critical events from which they should learn. This is opposed to the approach where the (prospective) entrepreneurs are presented with experiences from which they can learn. In the case of TLC, critical event recognition combined with logging served as an important tool for reflection, which provided participants with a wider range of meanings, paths, and consequences. Further, the development of an entrepreneurial mindset would benefit from the activities facilitating the dynamic loop of individual and collective participation, various modes of knowledge conversion, and connection to a concrete development project that would permit the interplay between experiential and theoretical knowledge. In this way, the three-phase learning processes of the TLC model present factors crucial for entrepreneurial learning – such as critical incidents, reflexive thinking, or co-creation of learning – in a systemic and interconnected way – as opposed to the literature focusing on one particular factor.

Major limitations of the study included relatively few circle meetings and short timeframes for data collection, which reduced the ability to trace the broad effect of transformational entrepreneurship at the social and organizational level.

Future research might extend the current study to one of addressing the development of entrepreneurial mindsets among less experienced entrepreneurs, entrepreneurs in developing countries, and transformational entrepreneurship for economic value creation, in order to assess how these various factors may affect learning processes and transformational outcomes. The findings of the study indicate that the process known as “unlearning” (e.g. McWilliam, 2008) is a constitutive element of developing an entrepreneurial mindset. The literature on entrepreneurial learning has not so far addressed

this issue, and therefore future research may focus on the role of unlearning for the development of an entrepreneurial mindset.

This study suggests that through the learning processes that facilitate the framing of one's own experience and praxis, amplification of one's own frame of reference, and reinterpretation of one's own praxis, one may achieve a change in their mindset and behavior. Referring to Kotter, 2012, achieving transformation in mindsets and patterns of behavior is the first step to implementing large transformations at the organizational/business level.

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## Attachment 1

The Guiding principles of the Transformative Learning Circles.

GUIDING PRINCIPLES	KEY QUESTIONS	INDICATORS
No.1. Entrepreneurship regarded as an organizational or collective function.	<i>How can I collaborate with others to bring about a change in our organization's way of operating?</i>	New pattern of collaboration initiated with one or more colleague with the aim of bringing about a change in the organization's way of operating.
No. 2. Entrepreneurial actions derived from ethical principles of global social responsibility, solidarity, and sustainability.	<i>How will the actions I plan to engage in, in the first instance, enable our organization to better contribute towards a more humane and sustainable society?</i>	One or more aspects of a society conducive to human flourishing in a global perspective identified. One or more connections between the organization's way of operating and the above aspects identified.
No. 3. Entrepreneurship aimed, in the first instance, at helping a collective (an organization, a community, the global society) realize their best potentialities.	<i>What as yet not (sufficiently) realized potentials are there in our organization that we could engage in realizing?</i>	One or more potentials or unrealized possibilities in the organization's operations, in keeping with the above, identified. One of measures undertaken to realize these potentials.

GUIDING PRINCIPLES	KEY QUESTIONS	INDICATORS
No. 4. Entrepreneurial innovation seeking primarily to transform the culture (the prevalent values, the quality of relationships, the meaningfulness of processes) of an organization.	<i>How will what I plan to engage in bring about fundamental changes in the way our organization operates?</i>	Specific needs for changes in the values and ethical principles underlying the organization's way of operating towards a greater degree of human flourishing and sustainability identified.
No. 5. Personal growth and development regarded valuable as a necessary requirement for being able to better serve the wellbeing of a collective (an organization, a community, the global society)	<i>How do I need to change myself in order to be able to better serve my organization and the global society?</i>	Needs for personal development identified in the light of increased capability to serve the organization and society at large in their development towards a higher level of humaneness and sustainability.

## Attachment 2

Each participant keeps a logbook between meetings. You should fill out General individual log and Critical Incident log. Tag it with "P" or "O" (P=personal, O=organizational) in order to reflect upon what are individual elements and what are organizational.

### General Individual Log

Entry date: .....

EFFORT	GUIDING PRINCIPLE	TRANSFORMATION INDICATOR	LEARNING
Here you describe what you have done to bring about a change in yourself or in your organization.	Here you explain which guiding principle you have applied and how	Here you describe the transformation you think has taken place and the indicator(s) thereof.	Here you describe what you and your organization have learned, what has facilitated that learning, and how the learning has brought you closer to the realization of your vision.

## Critical Incidence Log

Entry date: .....

<b>CRITICAL INCIDENCE</b>	<b>GUIDING PRINCIPLE</b>	<b>LEARNING</b>	<b>EFFECT (extra information)</b>
Here you describe a critical incidence pertaining to personal or organizational transformation. A critical incidence is an incidence that has had a decisive impact on a transformative process or itself has embodied a transformative event.	Here you explain what guiding principle the critical incidence has been an enactment of.	Here you describe the transformation that took place as a result of the incidence and what you and your organization have learned from the incidence	Here you describe what you consider as the effect for you and your organization

## Individual learning log that you want to share with your circle at your next meeting

Entry date: .....

<b>A PROCESS/AN INCIDENCE</b>	<b>LEARNING GAINED</b>
Choose one (critical) incidence or process from your personal log book that you feel has been particularly successful and that you want to share with your Circle at the next meeting. Write a description of what was done and what happened as a result.	Give your own analysis of what you/your organization have/has learned about enacting and applying guiding principles and the common goal state vision

## Meeting Learning Evaluation Log

- 1) Each participant takes up one aspect of the learning process carried out during the meeting that (s)he thinks was particularly successful and, if (s)he so feels, one aspect that (s)he thinks requires especially further development. The aspects are to be presented in the form of pictures that are then commented upon.
- 2) With the help of the facilitator, these views are summarized (closely related points categorized), leading to 1-3 points (in pictorial form) to be discussed.

- 3) The points are discussed by the Circle with the purpose of arriving at a unified understanding and decision(s), presented in pictorial form, as to:
  - a) what currently are some of the Circle's learning strengths and how the Circle can build on these in the future.
  - b) what currently are some of the Circle's learning needs and how these can be addressed in the future.

In stating and discussing learning needs, it is important that each participant voice her/his experiences and interpretations without accusing anyone. The purpose is to find a collective way forward, if possible, based on the identified strengths.

- 4) The evaluation part is closed with the facilitator recapping the identified learning strengths (showing the pictures depicting these).

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### **Abstrakt**

Rozwój myślenia przedsiębiorczego był ostatnio przedmiotem obrad polityków UE i jest przedmiotem troski nauczycieli. Tradycyjne podejście do edukacji przedsiębiorczej nie uwzględnia dwuznaczności procesu przedsiębiorczości. Niniejszy artykuł ma na celu zbadanie procesów uczenia się, które przyczyniają się do rozwoju ducha przedsiębiorczości w zakresie przedsiębiorczości transformacyjnej. Przedsiębiorczość transformacyjna odnosi się do zdolności i zamierzonego działania na rzecz zmiany w życiu przedsiębiorcy i organizacji, która przyczynia się do zmian społecznych i charakteryzuje się pojawieniem się nowego jakościowego wymiaru możliwości. Aby promować przedsiębiorczość transformacyjną, Nordic Network for Adult Learning opracował szczególny model uczenia się dorosłych, znany jako Transformative Learning Circles (TLC), przy wsparciu Nordyckiej Rady Ministrów. Artykuł opiera się na badaniu pilotażowego wdrożenia modelu TLC w kontekście krajów skandynawskich. Odkrycia ujawniają, że procesy uczenia się promujące ducha przedsiębiorczości dla transformacyjnej przedsiębiorczości zachodzą w trzech konkretnych fazach: 1) kształtowanie praktyki; 2) wzmocnienie ramy odniesienia; oraz 3) reinterpretacja praktyki. Badanie poszerza obecną wiedzę na temat uczenia się przedsiębiorczości na dwa sposoby. Po pierwsze, łączy kluczowe czynniki wpływające na uczenie się przedsiębiorczości z konkretnymi procesami uczenia się, ułatwiającymi rozwój ducha przedsiębiorczości dla transformacyjnej przedsiębiorczości. Po drugie, ilustruje, w jaki sposób te kluczowe czynniki mogą być wykorzystane razem w jednym modelu uczenia się wzmacniającym efekt uczenia się i transformujący.

*Słowa kluczowe: sposób myślenia o przedsiębiorczości, przedsiębiorczość transformacyjna, koła uczenia się, proces uczenia się przedsiębiorczości*

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# Collaborative effect of workplace ostracism and self-efficacy versus job stress

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## Abstract

*This paper aims to illuminate the association between workplace ostracism and stress since ostracism is the most prevalent form of mistreatment in modern-day work settings. The study also investigates the moderating role of employees' self-efficacy, gender, and work culture. Data was collected through a survey and structured questionnaires from employees working in both public and private sector banks in Pakistan. Data Analysis was conducted using statistical techniques such as bootstrapping, regression analysis and process macros. The study findings reveal that workplace ostracism is positively related to stress; and negatively related to employee's self-efficacy. Gender and organizational work culture have a moderating relationship. Self-efficacy mitigated the adverse effects of workplace ostracism in the form of stress, as self-efficacious employees tend to experience less stress in their workplace. Organizations must take account of the stress-mitigating impact of self-efficacy which is principally strong for producing acceptable performance since mistreatment and impolite behaviors cannot be evaded and prevented entirely in the social context of the contemporary workplace. Implications and future research directions are discussed in light of the findings.*

**Keywords:** workplace ostracism, stress, self-efficacy, conservation of resources theory, banking industry, Pakistan, Punjab

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## INTRODUCTION

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Workplaces are sites embodying specific regulations deemed as suitable in a particular society (Di Marco, Martinez-Corts, Arenas, & Gamero, 2018). Often, these regulations might be disregarded by employees as they engage in behaviors viewed as deviant at that instance and in that setting (Pawar, 2013), influencing their wellbeing, satisfaction (Di Marco, Martinez-Corts, Arenas, & Gamero, 2018) and workplace social context (Chung, 2018). Such social context has substantial importance in modern-day work settings since employees spend a significant amount of time with each other at work (Chung, 2018). Unfortunately, workplace social context has been increasingly characterized by negative attitudes and behaviors including various forms of mistreatment and victimization (Aquino & Thau, 2009) like incivility (Di Marco et al., 2018; Abubakar, Yazdian, & Behraves, 2018) social undermining (Duffy, Ganster, & Pagon, 2002), harassment, bullying (Einarsen, 2000), and abusive supervision (Tepper, 2000). One of the most prevalent of these is workplace ostracism (Fox & Stallworth, 2005; as cited by Steinbauer, Renn, Chen, & Rhew, 2018).

Regrettably, it is one of the neglected areas in the literature, especially in developing nations that perhaps might serve as a crucial determinant of negative mental states of personnel in the workplace, resulting in harmful behaviors. When personnel comes across verbal abuse, rude or indecorous behavior, or unfair burden in the workplace, mistreatment arises (Abubakar, Yazdian, & Behraves, 2018; McCord, Joseph, Dhanani, & Beus, 2018).

Some recent studies on mistreatment have tried to shed light on its harmful influences on employees' physical and mental health (Harnois & Bastos, 2018), turnover intentions (Chaudhry, Mahesar, Pathan, Arshad, & Butt, 2017; Lyu & Zhu, 2017) and interpersonal deviance (Jahanzeb & Fatima, 2017) among others. Mistreatment gives a feeling of social rejection and exclusion to the employees, which might hamper their capacity to contribute positively towards the achievement of organizational goals (Abubakar, Yazdian, & Behraves, 2018).

Since ostracism is found to be most prevalent in workplaces (Fox & Stallworth, 2005; as cited by Steinbauer, Renn, Chen, & Rhew, 2018), the focus of the current study is this kind of covert mistreatment, prevailing in the banking industry of a developing nation, Pakistan, where legislation regarding workplace mistreatment is rather weak. A couple of relatively recent studies show that most of the surveyed employees had sensed workplace ostracism (WPO) at one time or another during their work course (Fox & Stallworth, 2005; O'Reilly, Robinson, Berdahl, & Banki, 2014). Unfortunately, companies do not generally regard WPO as liable to be punished as it is usually considered as a passive form of mistreatment (Abubakar, Yazdian, & Behraves, 2018; O'Reilly et al., 2014).

Conservation of resources (COR) theory offers an insightful perspective to comprehend the impact of WPO. WPO depletes valuable resources which are vital to assist personnel in the workplace (Leung, Wu, Chen, & Young 2011). In such a situation, a person's defense mechanism might be triggered. In an attempt at protecting against additional resource loss, personnel might face continuous stress and go through more resource deficit, resulting in a range of adverse work-related outcomes.

According to Hobfoll, Halbesleben, Neveu, and Westman (2018), COR theory starts with the precept that people attempt to gain, retain, foster, and protect the possessions they centrally value. Among these commonly valued resources are health, sense of belongingness, well-being, family, self-esteem, and a sense of purpose and meaning in life. The degree of belongingness, social controls, self-esteem, and meaningful existence determine the level of individuals' personal and social resources. The threat to these resources may result in a tend-and-befriend reaction (Williams, 2007) and results in stress (Hobfoll et al., 2018). Additionally, in the premises of COR theory, personal, situational and other positive resources like self-control and self-belief might prove helpful in mitigating the adverse effect of resource loss that might ultimately be translated into poor performance.

WPO has been implied to be an interpersonal stressor (Williams, 1997; 2001; Jahanzeb & Fatima, 2017); nonetheless, researchers have seldom examined WPO from a stress standpoint (Chung, 2018) in a developing country. According to Wu Yim, Kwan, and Zhang (2012), it is imperative to examine the association between WPO and stress-related outcomes. Hence, the current study will investigate the association between WPO and stress in the non-western context of Pakistan, specifically in the banking industry, where jobs are characterized as one of the most stressful ones in Pakistan (Badar, 2011; Khattak, Khan, Haq, Arif, & Minhas, 2011).

Banking staff from junior to the most senior levels are involved in providing customer services and have frequent interactions with customers on a daily basis (Khattak et al., 2011). The daily customer turn-up in this industry is high (Badar, 2011), when compared to other service-related industries, since people in Pakistan must usually visit their bank for any financial transaction related to cash, cheques, paying bills, demand drafts, account statements, and other queries. Also, the task inter-dependence of banking colleagues is on the higher side. Employees must interact with each other, management, peers and colleagues frequently to complete customer-related tasks (Badar, 2011). According to Aquino & Thau's (2009) prediction, employees can expect to be a victim of workplace mistreatment when it is vital for them to interact with each other more often and to work interdependently. Such high task interdependence may transmute into

magnified adverse impacts of workplace ostracism, and consequently, such effects will shift towards bankers' services to customers. It is also important to note that the work culture, context, and processes in the public versus private sector in Pakistan are noticeably different (Rashid & Rashid, 2012; Khan, Safwan, & Ahmad, 2011; Khan, Aslam, & Riaz, 2012), and therefore the intensity and effects of mistreatment in these sectors might be different.

Interestingly, extant literature has shown mixed results between various forms of mistreatment and their effects between the genders (e.g., see Aquino & Thau, 2009). Women are also found to sense more stress, anxiety, and distress. According to the American Psychiatric Association (2000), females are more frequently diagnosed with general anxiety as compared to males. The banking sector in Pakistan, characterized as stressful (Badar, 2011), means higher stress levels for women as compared to men. Since women are found to be more relationship-oriented and attain a sense of identity through affiliation, depicting themselves using relational terms, such as "giving", "helping", "caring", "being kind", and "not hurting others" (Gilligan, 1982); it is expected that the negative influence of mistreatment on women, in the form of stress, might be more nuanced comparative to men. The early socialization theory attributes such differences in value orientation, as internalized through the early socialization process. The theory emphasizes that regardless of social changes, gender remains an elementary social category that outlines a person's values, perceptions, work-related outlook and behaviors (Danziger & Eden, 2007). Studying the effect of gender, in ostracism, stress relationships, in Pakistan would be an added contribution to the literature.

Furthermore, there are calls for identifying various boundary conditions (Chung, 2018; Lyu & Zhu, 2017; Abubakar, Yazdian, & Behraves, 2018; Zhu, Lyu, Deng, & Ye 2017) that might mitigate or exacerbate adverse effects of ostracism, by applying theories other than job embeddedness (Lyu & Zhu, 2017) in the service sector (e.g. banking, hospitality and others) of a developing country (Abubakar, Yazdian, & Behraves, 2018) since they are underexplored (Chung, 2018). Based on conservation of resources theory (COR) (Hobfoll, 1989) and answering to the call of Abubakar, Yazdian and Behraves, (2018) to include psychological capital as a boundary condition in the form of a personal factor, the present research argues that self-efficacy (SE) (a person's primary belief in his or her capabilities and control over outside events), would serve as a mitigating agent and buffer the detrimental influence of workplace ostracism on stress in the banking industry in Pakistan.

Moreover, this study offers an exciting social, in addition to institutional, counterpoint to the leading Western (mainly US and UK) based researches (Quratulain, Khan, Crawshaw, Arain, & Hameed, 2016) of workplace ill-treatment (e.g., Steinbauer et al., 2018). Pakistani culture, being relatively high

in power distance, collectivism and uncertainty avoidance, points to a society with a high rule orientation, and support to high disparities in authority and prosperity (Hofstede, 2001). Such a cultural sketch might endorse stout interpersonal and deferential links among employer and employee and signal general absolute respect for power (Hofstede, 1991; Khilji, 1995). This cultural outline suggests that employees might swallow or absorb any agitation caused by workplace mistreatment without any retaliatory or hostile action towards the organization or the boss, and continue working in the same job in the absence of too many job opportunities. This endurance of workplace mistreatment without demonstrating any overt reaction might result in a stressful mental and emotional state.

## LITERATURE REVIEW AND THEORETICAL FRAMEWORK

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### Workplace ostracism (WPO)

Ostracism points to the extent to which an individual feels overlooked or excluded by another person, persons or group of persons (Ferris, Brown, Berry, & Lian, 2008; Williams, 2007). It has been found to exist in several important social contexts, involving workplaces (Balliet & Ferris, 2013; Fox & Stallworth, 2005). Workplace peers including colleagues and/or supervisors might occasionally engage in behaviors like isolating or disconnecting others from workplace-related social interactions, in the form of shunning, averting eye contact, exiting the room when another person comes in, transferring or shifting a person to a remote place, and failing to answer coworkers' greetings (Ferris et al., 2008; Robinson, O'Reilly, & Wang, 2013; Xu, Huang, & Robinson, 2017).

Ostracism is distinct from constructs of often studied workplace mistreatment behaviors such as interpersonal deviance, bullying, social undermining, aggression, and harassment in numerous aspects. First, these concepts are interactional. Ostracism is identified by a lack of interaction thereof. In other words, WPO is depicted as: "the omission of positive attention from others, rather than the commission of negative attention" (Robinson, O'Reilly, & Wang, 2013; p 208). Because of attention omission, WPO instigates significant risk to a person's sense of belongingness, which is a basic human necessity (Baumeister & Leary, 1995; Fiske, 2004). Such attention omission may result in some adverse mental and behavioral outcomes.

Secondly, the social background and pertinent norms verify the social acceptance of ostracism (Lustenberger & Williams, 2009; Williams, 1997; 2007). Therefore, when a person senses ostracism; it may not be deemed the same way by another (Robinson, O'Reilly & Wang, 2013). According to Robinson,

O'Reilly, and Wang (2013), WPO does not necessarily entail a desire to inflict harm to the sufferer. Occasionally, individuals may overlook peers since they are preoccupied with their job tasks (Ferris et al., 2008; Williams, 2001; Zhao, Peng, & Sheard, 2013). This suggests that a person might feel ostracized, though others have no deliberate intentions whatsoever to ostracize him/her. Sometimes people might just be busy with work. At other times, the nature of the job and context of workplace might be such that it aggravates the feeling of ostracism, though there is no intentional will of employees to involve in such acts. Due to this, the frequency of experiencing ostracism might be increased, even though it might not exist or might exist less frequently.

## **Job stress**

The word “stress” is in part derived from old French’s ‘extreme,’ meaning narrowness or oppression, and in part from the Latin’s “stringere” meaning to draw tight. In the 17th century, such words were used to denote hardships, adversity, and strain. Today stress is frequently expressed as a sense of being overwhelmed, concerned or run-down. The term “stress” was coined by Hungarian-Canadian experimentalist Hans Selye in 1936 (Selye, 1973), who described it as the non-specific reaction of the body to any need for change. It is a reaction to any internal or peripheral stimulus that generates discrepancy in one’s physiological or psychological equilibrium.

In the current literature, several definitions have been used to describe stress. This study operationalizes stress by the ‘Encyclopedia of Stress,’ where stress is defined as “real or an interpreted threat to the physiological or psychological integrity of an individual that results in physiological and behavioral response” (Fink, 2000).

Keeping in view that stress is a personal response to some variations in the environment, Pestonjee (1973) has tried to classify three vital areas of life, which might result in stress. These areas are job/ organization, the social sector, and the intrapsychic sector. The current study deals with the on-the-job stressor in the form of workplace ostracism since it is one of the most prevalent forms of workplace mistreatment (Fox & Stallworth, 2005; as cited by Steinbauer, Renn, Chen, & Rhew, 2018) and has seldom been studied in the context of the banking industry of developing nations. Ostracism might be a significant cause of stress in employees that might trigger physiological and behavioral responses in the workplace.

## **Ostracism and stress**

According to Chung (2018), comprehensive studies have not yet inspected the connections between WPO and the perceived stress of personnel.

The present study tries to fulfill this opening by empirically studying the association between perceived stress and workplace ostracism.

WPO has a harmful influence on the wellbeing of personnel since it is an excruciating and disliked experience (Ferris et al., 2008). Researchers have demonstrated that ostracism is related to negative affect (Williams et al., 2002), frustration, sadness, nervousness (Anderson & Pulich, 2001; Colligan & Higgins, 2006), emotional exhaustion (Wu et al., 2012) and adverse emotional conditions, for instance, sorrow, despair, solitude, envy, culpability, indignity, embarrassment and social apprehension (e.g., Gruter & Masters, 1986; Leary, Koch, & Hechenbleikner, 2001). Moreover, importantly, Williams (1997, 2001) proposed that ostracism can be contended as an interpersonal stressor, consequently, ensuing in stress.

### ***Ostracism and stress in light of COR theory***

Conservation of resources (COR) theory most coherently captures the essence of this idea. COR embarks on the principle that people endeavor to attain, preserve, foster and defend the belongings they centrally value (Hobfoll, 1989). COR theory posits that “stress occurs (a) when central, or key resources are threatened with loss, (b) when central or key resources are lost, or (c) when there is a failure to gain central or key resources following significant effort” (Hobfoll et al., 2018; p.104).

Since affiliation, belongingness, and support from coworkers and supervisors represents a critical social and job resource, when faced with silent treatment in the workplace, personnel might develop a feeling of losing a valuable resource and therefore feel stressed. Based on these arguments, it is hypothesized that:

**H1:** Workplace ostracism has a positive relationship with job stress.

### **Self-efficacy (SE)**

Self-efficacy refers to a person’s perception of their capability to carry out their work-related duties (Bandura, 1997; Coeurderoy, Guilmot, & Vas, 2014; Parker, 1998). General self-efficacy (GSE) is defined as “individuals’ perception of their ability to perform across a variety of different situations” (Judge, Erez, & Bono, 1998, p. 170). According to Zhou, Ma, and Dong (2018), it advanced from social cognitive theory’s (Bandura, 1997) notion of SE generality. GSE is distinct from SE, in that GSE is a comparatively steady belief about generalized competence and is like a trait, whereas SE is a comparatively accommodating, task-specific belief (Chen, Gully, Whiteman, & Kilcullen, 2000; Chen, Gully,

& Eden, 2001). This study will utilize these terms interchangeably. Though, wherever the term SE is used, it is operationalized as GSE.

### **Self-efficacy, ostracism, and stress**

Personnel who display a higher level of self-efficacy can find several routes to task completion since they are apt in employing different knowledge handling actions to optimize their knowledge foundation (Bandura, 1997; Seggelen-Damen & Dam, 2016; Yeo & Neal, 2006). This leads to increased viability for fulfilling organizational expectations, which consecutively would lead to reduced levels of stress that they go through when completing job tasks (Schwarzer & Hallum, 2008) mainly when the cause of stress is being targeted with ostracism.

In line with the underlying principles of COR theory, a person's SE should reduce their ostracism linked sense of stress, since this personal resource lessens the fear of not being able to accomplish their work duties (Hobfoll & Shirom, 2000). The personal resource of SE, therefore, should reduce the probability that personnel sense more stress in stressful situations related to workplace mistreatment, specifically ostracism. According to COR theory, personnel with higher self-belief in their capabilities and expertise tend to accomplish their job-related goals more often since unconstructive feelings like stress arising due to social exclusion, will less probably diminish their resource reservoirs. Therefore, they do not need to preserve energy while at work (Hobfoll, 2001). Combining these arguments, this study predicts a moderating role of self-efficacy to offset the adverse effects of stress due to WPO.

**H2:** Self-efficacy moderates the relationship between workplace ostracism and stress, such that the relationship will be weaker in the presence of high self-efficacy and vice versa.

### **Gender as moderator**

It has been observed in recent studies related to stress (e.g., Han, Shim, & Choi, 2018) that gender and work culture can have differential effects on an employee's work-related attitudes and emotional health. According to Aquino and Thau (2009), researchers examining relationships concerning gender and mistreatment do not display a clear association among these variables. Some studies related to workplace mistreatment and gender, demonstrate them to be unrelated, (Vartia, 1996; Einarsen & Skogstad, 1996, Zellars, Tepper, & Duffy, 2002; Vartia & Hyyti 2002), whereas other studies show women reporting more cases of mistreatment at work as compared to men (Aquino & Bradfield

2000; Cortina, Magley, Williams, & Langhout, 2001; Tehrani, 2004; Salin, 2001). In sharp contrast, some research has also demonstrated men reporting more instances of mistreatment than women (Jennifer, Cowie, & Ananiadou, 2003).

Such a review of the literature shows mixed results regarding the role of gender concerning mistreatment. Additionally, to enrich limited existing literature concerning gender and workplace mistreatment in Pakistan, and in line with the early socialization theory (Danziger & Eden, 2007), this study tests the effects of gender as a moderator in the relationship between ostracism and stress, and therefore hypothesizes that:

**H3:** Gender has a moderating effect between workplace ostracism and perceived job stress.

### **Work-culture as moderator**

Though gender might be an essential demographic variable, related to workplace mistreatment and the mental health of employees, Bowling and Beehr (2006) described these relationships as relatively weak as compared to the influence of work environment variables. There is a need for additional empirical research to include the broader work context for comprehending organizational behavior in public-private sector organizations (Perry, 2000). Therefore, we also include work-culture as a moderator in this study and take the public-private sector as a proxy for this variable. According to Rashid and Rashid (2012), there is an overall agreement regarding variances between public and private sector employment. They put forward that though researchers have studied differences and similarities in public and private sectors, they have found mixed results.

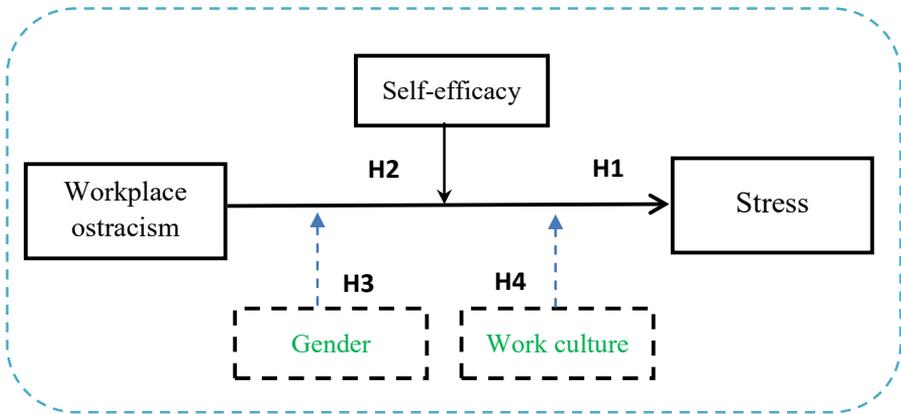
Public and private sector organization's work-culture differ significantly in terms of work contents, their quality, job independence, task interdependence, participation in decision-making, challenge and variety of work, task significance and quality of social relations (Baldwin & Farley, 1991; as cited by Rashid & Rashid, 2012; Aryee, 1992).

Studies have found mixed results regarding social relations and context in public versus private sector organizations. Jurkiewicz, Massey, and Brown, (1998) report public sector employees and supervisors to be friendly and congenial acquaintances as compared to private sector employees. On the other hand, Lyons, Duxbury, and Higgins (2006) and Khojasteh (1993) did not find evidence for this variance in their research. Gabris and Simo (1995) showed that public versus private sector employees do not vary in their need for affiliation. While, other researchers have demonstrated the public sector's work environment to be characterized by the poor quality of

relationships, helping behavior and concern among subordinates, co-workers and bureaucratic superiors (e.g., Smith & Nock, 1980).

Similarly, Salin’s (2001) survey of 377 Finnish personnel showed that public sector employees experienced more workplace mistreatment as compared to their counterparts in the private sector. To study the effects of work-culture on the relationship between workplace ostracism and stress in Pakistani banks, we propose the following hypothesis:

**H4:** Work-culture has a moderating effect between workplace ostracism and perceived job stress.



**Figure 1:** Theoretical framework

**METHODOLOGY**

The population for this research was selected from the financial, explicitly banking industry of Pakistan, to answer the call of Abubakar, Yazdian, and Behraves (2018). The population count was unknown. Data were collected from employees working in public and private sector banks located in the Punjab region. It is imperative to ensure that the organizational environment chosen to be studied must reflect the attitudes and behaviors relevant to the study; and the variables required to be studied in the research model (Zhou & George, 2001). Banking employees in Pakistan, from top to bottom of the hierarchy, have daily interaction with their colleagues, customers, and supervisors, and stress levels are usually high due to workload and maltreatment. The task interdependence is also high which might aggravate

the intensity of WPO. The non-probability convenience sampling method was utilized for the study because of the geographical dispersion of banks and the fact that population size was unknown. Additionally, due to the cost and the time constraint for conducting the study, researchers were forced to go for convenience sampling. The data was collected through structured questionnaires. In Pakistan, the official language spoken in most proficient business organizations and educational institutes is English. Since banking personnel in Pakistan get their degrees from colleges and universities where the study language is also English (De Clercq, Haq, & Azeem, 2018), it was therefore believed that participants would be able to understand and answer the questionnaire adequately and there was no need to translate the questionnaire. So, the survey was written in English. Three hundred and ninety questionnaires were floated in random banks of the South-Punjab region, of which 245 were returned. Thirty-eight were incomplete, and 8 had other errors. The respondents did not return the rest of the questionnaires at T2. A total of 219 questionnaires were received in analyzable, complete form and were included for analysis. The response rate was 63%. Considering the time-lagged data collection, this response rate is acceptable (Jahanzeb & Fatima, 2017). Comparatively more participation from male respondents (122; 56.2%) was witnessed as compared to females (97; 43.8%). Sector-wise, we received 81 responses from employees working in public sector banks, whereas 138 were from private sector banks.

## **Instruments**

### **WPO**

A ten-item scale created and validated by Ferris et al. (2008) was utilized to measure workplace ostracism. The scale is a five-point Likert scale. The responses ranged from 1 ('strongly disagree') to 5 ('strongly agree'). Some of the items from the questionnaire were 'Others ignored me at work', 'Others left the area when I entered', 'Others at work do not invite me or ask me when they go out for a break', 'Others do not talk to me at work' and 'My greetings have gone unanswered at work'. This scale has been used by earlier researchers, for instance by Chung (2018), where the reliability of this scale was 0.97 and by Khair and Fatima (2017) with a Cronbach's alpha of 0.89.

### **Self-efficacy**

An eight-item scale developed and validated by Chen, Gully, and Eden (2001) was used to measure self-efficacy. This was also a five-point Likert scale, and

responses ranged from 1 (“strongly disagree”) to 5 (“strongly agree”). Some of the items from the scale are: “I will be able to achieve most of the goals that I have set for myself” and “I am confident that I can perform effectively on many different tasks.” The Cronbach’s alpha for this scale was 0.81 as used by Zhou, Ma, and Dong (2018).

## **Stress**

A seven-item scale (Galinsky, Bond, & Swanberg, 1998) was used to measure stress and inquired about how frequently over the last three months the respondents felt in a variety of ways (e.g., “nervous or stressed,” “emotionally drained from work”). The response options were in the form of a five-point Likert scale. This scale is like the one used by Kandel, Davies, and Raveis (1985) regarding content. Earlier, Behson (2005) utilized the same scale.

## **Control variables**

Age, education, and experience were included as control variables since earlier studies have shown these to affect ostracism and burnout related outcomes and have been controlled in recent studies (e.g., Chung, 2018; Lee & Ok, 2014). This will ensure that the relationships between variables are not confounded.

## **DATA ANALYSIS**

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The data was analyzed using the Process Macros (Hayes, 2017) as it is one of the latest and practical techniques to deal with latent variables. The study aimed to unpack the direct and interactive effect of workplace ostracism on stress using self-efficacy as a moderating variable. The Process Macros model-1 has been applied to get the desired results. Before testing the primary hypotheses, various tests were carried out in SPSS and AMOS to check the viability of the data to measure the relationship above. These tests involved confirmatory factor analysis, descriptive statistics, validity & reliability analysis, correlation analysis and, finally, hierarchical regression analysis.

## **Descriptive and correlation analysis**

To test the underlying supposition, researchers obtained data from the Banking industry operating in the southern Punjab region of Pakistan. The descriptive statistics of the respondents are presented in Table 1 which indicates that on average, the age of the respondents was above 31 years with a variation of 7-8 years of age. Further, on average their experience is

above seven years with a variation of six years, which means respondents were a mix of young and experienced employees. Moreover, their education level was above graduation, and comparatively more participation from male respondents was witnessed, i.e., male 122 (56.2%) and female 97 (43.8%). Sector-wise, we received 81 responses from employees working in public sector banks, whereas 138 were from private sector banks. The correlation values indicate a moderate correlation among all constructs (see Table 1). This is by the guidelines of Cohen, Cohen, West, and Aiken (2013).

Regarding the instruments, the only items that were included had above 0.4-factor loading as per criteria set by DeCoster (1998) and had above 1 eigenvalue. The values of Cronbach (1951) surpassed the qualifying criteria as laid down by George and Mallery (2016), i.e., “Reliability range:  $\geq 0.9$ =excellent,  $\geq 0.8$ = good,  $\geq 0.7$ = acceptable,  $\geq 0.6$ = questionable  $\geq 0.5$ =poor and  $< 0.5$  =unacceptable”. The values of alpha were found to be above the required criteria value, i.e., WO= 0.88, SE= 0.87 and ST= 0.78.

**Table 1.** Descriptive and correlation analysis

Constructs	Mean	SD	AG	EP	EL	WPO	SE	ST
Age (AG)	31.04	7.75	1					
Experience (EP)	7.46	6.26	0.98**	1				
Education Level (EL)	2.20	0.54	0.29**	0.42**	1			
Workplace Ostracism (WPO)	3.38	0.85	-0.12	-0.08	-0.11	1		
Self-Efficacy (SE)	3.31	0.89	0.08	-0.02	-0.02	-0.54**	1	
Stress (ST)	3.23	0.64	0.17*	0.12	0.12	0.61**	-0.65**	1

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ .

### Confirmatory Factor Analysis (CFA)

AMOS-Version 20 was used to carry out the Confirmatory Factor Analysis (CFA). It was executed to ensure the validity of the instrument and its appropriateness in the given context as it is important to generalize the obtained results of the study (Hoyle, 1991). The CFA was completed using the guidelines of McArdle (1996) as it is suitable to reach the model fit indices step by step based on the standards present in work done by Kline (2006). The present study involved three latent variables; workplace ostracism having a ten items scale; self-efficacy having an eight items scale; and stress with a seven items scale. The fit indices have been attained by following Byrne (2013). The results suggested that all constructs have been satisfactorily operationalized and measure what they intend to measure (see table 2). The model fit indices showed suitable figures within acceptable ranges i.e.,

Chi-square/df = 2.42<3.00, RMSEA = 0.057<0.08 and GFI=0.911-BBNNFI=0.969 –CFI= 0.943-IFI= 0.958 >0.90 (see Table 2).

Further, Table 2 also explains the Average Variance Explained (AVE). It is an indicator that assesses the convergent validity. All the values surpassed the value of 0.5, which is an acceptable criterion jointly with the reliability coefficient alpha having higher than 0.7 values. This ensured the constructs have convergent validity. The values of the indicators laid within an acceptable range i.e., workplace ostracism ( $\alpha= 0.88$ , AVE= 0.61), self-efficacy ( $\alpha= 0.87$ , AVE= 0.62) and stress ( $\alpha= 0.78$ , AVE= 0.57). Further, to investigate the discriminant validity, Average Shared Variance (ASV) was calculated. However, before computing ASV, it was observed that the correlation among constructs was less than 0.7 (see Table 1). All latent constructs have correlation coefficient values of less than 0.7. Here the highest correlation exists between SE & ST (i.e., 0.65), the square of which is 0.42 (42%) which is manageable as it is below 0.50. These values ensure the distinctiveness of the factors.

Furthermore, the values of ASV are also manageable and ensured the unique capability of the construct, i.e., workplace ostracism= 0.22, self-efficacy= 0.21 and stress= 0.18. The values of Composite Reliability (CR) are also within the acceptable range as 0.89, 0.87 & 0.79 are more significant than 0.70 for workplace ostracism, self-efficacy and stress, respectively, as defined by Hair, Black, Babin, and Anderson (2010). Hence, from the values of CR, AVE, ASV, and MSV, it can be determined that factors are valid and reliable enough to measure what they are intended to measure.

**Table 2.** Confirmatory Factor Analysis and scale reliability

Construct Descriptions	Chi-Square/df	RMSEA	GFI	CFI	BBNNFI	IFI	CR	AVE	MSV	ASV
Fit Indices	2.42	0.057	0.911	0.943	0.969	0.958				
WPO							0.89	0.61	0.42	0.22
SE							0.87	0.62	0.41	0.21
ST							0.79	0.57	0.39	0.18

**Note:** acceptable range of indices Chi-square/df <3.0, GFI-CFI-BBNNFI-IFI>0.90, RMSEA <0.08, CR= Composite Reliability, AVE= Average Variance Extracted, WPO= Workplace Ostracism, SE= Self-Efficacy, ST= Stress, MSV= Maximum Shared Variance, ASV= Average Shared Variance.

### Hypotheses testing

After conducting the initial analysis, which ensured the validity and reliability of the data, the descriptive and correlation analysis, the next step is the testing of the leading hypotheses for which this study was conducted. The results of the critical hypotheses were obtained by utilizing the latest

method introduced by Hayes (2017), more renowned as Process Macro (Model-1 was used) using SPSS.

### Checking pre-requisites for regression analysis

Before executing the hierarchical linear regression, preliminary tests were conducted to ensure the appropriateness of the data for regression analysis. Since data was found to be reliable and valid in the earlier section, the skewness and kurtosis tests were carried out next to certify the normality of the data. The data was acceptable within standards set by Hair et al., (2010) as the values of skewness and kurtosis were found to be between -1 and +1. Further plotting of these values in a graph resulted in a straight line that confirmed its normality.

Moreover, the standardized residuals centrality to zero with linear relationship guaranteed that there was no element of heteroscedasticity in the data. The results were also in tolerance since the Variance Inflation Factor (VIF) was also within the acceptable ranges, i.e., tolerance 0.41 and VIF 2.15 (Kline, 2014). With the analysis of heteroscedasticity, tolerance, and variance inflation factor, it was confirmed that there was no multi-collinearity in the data. Additionally, to confirm the non-existence of auto-correlation, a Durbin-Watson test was executed, and the results showed that there was no autocorrelation prevailing in the data. The results of the pre-requisite analysis above allowed researchers to execute the regression analysis with full confidence.

### Direct effect

To check the effect of workplace ostracism on stress and the interactive effect of self-efficacy on workplace ostracism and stress, at the first level, a hierarchical linear regression analysis was conducted using SPSS. The results of the direct effect revealed that workplace ostracism is positively related to stress as there was a 37% variation found in stress due to workplace ostracism ( $R^2 = 0.37$ ,  $t = 9.32$ ,  $p < 0.05$ ). The results of the F-statistics confirmed the general viability of the overall regressed model ( $F = 108.543$ ,  $p < 0.05$ ). It can, therefore, be concluded that employees ostracized in the workplace remain under stress (Table 3).

**Table 3.** Results of regression analysis

Relationship	R <sup>2</sup>	ΔR <sup>2</sup>	f-value	β	t-value	ρ
WPO→ST	0.37		108.543	0.56	9.32	**
WPO*SE (ST)		0.063		0.423, 0.627, 0.841		**

Note: \*\* $p < 0.05$ , WPO=Workplace Ostracism, ST= Stress.

### Moderating effect of SE

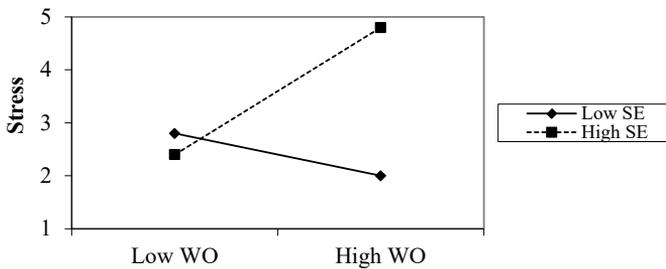
In the second phase, the interactive effect of self-efficacy on the relationship between workplace ostracism and stress was analyzed. The results reflected that self-efficacy buffers the adverse effect of workplace ostracism on stress ( $\Delta R^2= 0.063, p<0.05$ ). The employees having a high level of self-efficacy can prevent the negative consequences of workplace ostracism and sense comparatively lesser levels of stress. At the second level, the hierarchical linear regression results were reconfirmed through Process Macros and are shown in Table 4. The results indicated that self-efficacy could be a tool used by employees to safeguard themselves from the harmful effects of workplace ostracism.

**Table 4:** Moderating Effect Through Bootstrapping Process

Outcome	Predictor	R <sup>2</sup>	$\Delta R^2$	Effects	f-value	$\beta$	SE	t-value	LLCI	ULCI	$\rho$
ST		0.370			108.543						**
	WPO					0.420	0.134	9.320	1.465	2.990	**
	SE					0.620	0.130	7.760	1.876	3.143	**
	WPO*SE		0.063		167.480	0.840	0.035	10.440	2.122	3.552	**

Note: \*\* $p<0.05$ , IV=Workplace Ostracism (WPO), DV=Stress (ST), M=Self-Efficacy (SE), LLCI= Lower Level Confidence Interval, ULCI= Upper-Level Confidence Interval, Applied Model 1 of Hayes (2017) with 5000 bootstrapping process. M values at 18th, 54th, and 85th percentiles.

The graphical representation of the mentioned interaction effect is shown in Figure 1, which also explains that a high level of self-efficacy helps employees to reduce their stress level induced by workplace ostracism.



**Figure 2.** Interaction effect of self-efficacy on the relationship between workplace ostracism and stress

## Moderating effects of gender and culture

Since differences were expected between the groups of gender and work-culture, regarding WPO and stress, these were included as two possible moderators in the relationship between workplace ostracism and stress, which gives a shape of multi-group perspective to this study. The dimensions of these moderators are mutually exclusive (i.e., for gender: male and female; and for work-culture: public and private sector). The free and structural weight constraint models were compared to inspect the difference between the two groups by observing the change in the chi-square value.

The statistics reflected in Table 5 are showing a difference of 244.283 for gender and 173.581 for work-culture in chi-square values against the critical value of 0.05 extracted from the table at a significance level of 0.05. The results confirmed that there is a significant difference between the two groups in both cases, i.e., gender and work-culture.

**Table 5.** Comparison of free and constraint models for verification of the moderating effect of gender and culture

Moderator	Model	X <sup>2</sup>	df	CFI	RMSEA	ΔX <sup>2</sup> /Δdf	Sig.
Gender	Free Model	2945.271	335	0.891	0.075	--	--
	Structural weight constrained model	3189.554	300	0.874	0.071	6.98	Yes
Culture	Free Model	2788.191	335	0.905	0.066	--	--
	Structural weight constrained model	2961.772	300	0.893	0.062	4.96	Yes

After observing a remarkable difference between the two groups, the path coefficients and critical values were calculated to test the strength of the moderating effects of these two groups on the stated relationship between workplace ostracism and stress. The values in table 6 show that females are more prone to stress due to ostracism as compared to male employees. Furthermore, the stress caused due to workplace ostracism is more prevalent in the public sector banks of Pakistan as compared to the banks operating in the private sector.

**Table 6.** Comparison of path coefficients

Path	Male	Female	CR	Public	Private	CR
WOS→Stress	0.512*	0.715*	3.544	0.672*	0.213*	2.187

Note: \*p<0.01.

## DISCUSSION

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The prevalence of mistreatment represents a significant problem in contemporary workplaces, which results in severe consequences for the organization as well as mistreated employees; from physical and mental harm to deviant behaviors and turnover. This study extends the present body of knowledge by showing that WPO, as a passive form of mistreatment, affects employees' mental state and is related to stress. Earlier studies have shown stress to be linked with detrimental outcomes (Chung, 2018) but WPO has seldom been linked to stress and needed to be studied from a stress point of view (Wu et al., 2012; Chung, 2018), which makes this study a significant contribution to the present literature. COR theory ideally suited the cause, being a stress theory that describes the motivation that drives humans to both maintain their current resources and to pursue new resources. It offered an insightful perspective to comprehend the impact of WPO since WPO depletes valuable resources which are vital to assist personnel in the workplace (Leung et al., 2011). In such a situation, a person's defense mechanism is triggered. In an attempt to protect against additional resource loss, personnel face continuous stress and go through more resource deficit, resulting in a range of adverse work-related outcomes.

The study findings show that the social environment in the workplace is significant and can critically disturb the mental and emotional well-being of organizational members. As earlier researchers found workplace ostracism to be positively associated with anxiety and depression (Ferris et al., 2008), emotional exhaustion (Wu et al., 2012) and negative affect (Williams et al., 2002), this study found workplace ostracism to be positively related to perceived stress. Exclusion and silent treatment can produce negative self-perceptions, and such an emotional state can act supplementarily in authorizing a person to sense a lack of control and a resource loss (e.g., need of belongingness). When people are ostracized, they feel a lack of social support from colleagues and supervisors, and thus, a resource loss is perceived since social support has been claimed to be a critical resource in stressful situations (Hobfoll, 1989). Because of these undesirable experiences, ostracized people will likely perceive stress; consequently, suggesting that WPO can be another source of stress in the workplace.

Furthermore, earlier studies have demonstrated that people belonging to collectivistic societies are inclined to give undue importance to harmonious interpersonal relations (Yang, 1993), and therefore, such individuals might be more susceptible to workplace mistreatment in the form of ostracism (Powell, Francesco & Ling, 2009). Being relatively high in power distance, collectivism and uncertainty avoidance points to a society with high rule orientation and

support to high disparities in authority and prosperity (Hofstede, 2001). Such a cultural sketch might endorse stout interpersonal and deferential links among employer and employee and signal general absolute respect for power (Hofstede, 1991; Khilji, 1995). This cultural outline suggests that employees might swallow or absorb any agitation caused by workplace mistreatment without any retaliatory or hostile action towards the organization or the boss and continue working in the same job. Such an endurance of workplace mistreatment, without demonstrating any overt reaction, might result in a more stressful mental and emotional state leading to adverse work-related as well as non-work related outcomes.

Another significant contribution of this study is the demonstration that SE acts as a boundary condition in mitigating the adverse effects of WPO. Such variables are underexplored factors that inform this process. Consistent with COR theory, to the extent that employees are exposed to co-worker's disrespectful work behaviors, the personal resource of self-efficacy is particularly useful for mitigating the anxiety they experience due to mistreatment. The more confident employees are about their capabilities, the less likely they are to feel overburdened by emotional, mental state due to their ability to complete their job tasks successfully (Bandura, 1997) which frees up some of their energy to devote to positive performance-enhancing activities (Hobfoll & Shirom, 2000; McCarthy, Trougakos, & Chang, 2016). Thus, lower stress, due to higher confidence in their capabilities, is instrumental and enables employees to focus on the successful execution of their work tasks instead of being distracted by workplace anti-social context. The collaborative effect of SE and WPO on stress thus aligns with the COR logic that efficacious employees utilize personal resource of efficacy to meet their job requirements and find it particularly useful in the presence of unfavorable resource-draining work conditions. Overall, the moderated model of the study showed that the effects of SE mitigate the effects of WPO, adding to the extant literature on boundary conditions for workplace ostracism and its consequences.

Lastly, as mentioned before, earlier studies have demonstrated mixed results regarding the influence of gender (Vartia & Hyyti, 2002; Tehrani, 2004; Jennifer, Cowie, & Ananiadou, 2003) and work-culture (Jurkiewicz, Massey and Brown, 1998; Khojasteh, 1993; Salin, 2001), in relation to workplace mistreatment. This study has shown that, in Pakistani banks, gender, as well as work-culture, plays an important role. Women here are more prone to stress due to workplace ostracism, whereas the phenomenon of ostracism is more prevalent in public sector banks as compared to private sector banks. These findings are in line with the findings of Smith & Nock (1980) and Salin (2001).

## CONCLUSION

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This research study has tried to extend the current body of knowledge by investigating the relationship between workplace ostracism and stress based on the COR theory. Our model has shown that although workplace ostracism leads to stress in employees, self-efficacy as a moderator and personal resource can mitigate the strength of this relationship. The belief in self-capabilities and the confidence to carry out any activity successfully can weaken the strength of any harmful stress they feel due to WPO. Data was collected from the banking industry in the southern Punjab region of Pakistan from employees working in public and private sector banks. Results have confirmed all the hypotheses and found the moderating impacts of self-efficacy on the relationship between workplace ostracism and stress. This implies that when workplace ostracism is increased, harmful stress might be reduced to a certain degree due to the presence of SE. Additionally, the study also provided support for the fact that women feel more stressed due to WPO and WPO prevails more in banks operating in the public sector of Pakistan as compared to private sector banks.

### Theoretical contribution

The conservation of resources theory endorsed the association between workplace ostracism, stress, and self-efficacy in the context of the banking industry in the Punjab region of Pakistan. COR theory posits that “stress occurs (a) when central, or key resources are threatened with loss, (b) when central or key resources are lost, or (c) when there is a failure to gain central or key resources following significant effort” (Hobfoll et al., 2018; p.104). This research explains and provides evidence that workplace mistreatment in the form of ostracism is considered as a threat to a valuable resource (need for belongingness) and is therefore related to stress. If not controlled for, such stress might lead to decreased job satisfaction, job performance, deviant/counterproductive behaviors, and increased turnover.

The research also utilized self-efficacy as a personal resource in the premises of COR for mitigating the adverse effect of resource loss arising from WPO and contributing to stress. Self-efficacy is the degree of belief in one’s capabilities to be successful in a variety of situations. This study has demonstrated that individuals who have a higher sense of self-efficacy would be less affected by the negative influence of WPO. Though some level of stress is considered necessary for efficient and effective working, yet to the degree where stress acts as harmful, self-efficacy might be used as a useful resource for mitigating its adverse effects. Highly self-efficacious individuals are less

prone to sense stress in the face of mistreatment. They focus and dwell more on their capabilities rather than on other's behavior that results in stress. Self-efficacy is one of the dimensions of psychological capital, others being hope, optimism, and resilience. It would be interesting to study the effect of these dimensions, generally or exclusively, on the relation between WPO or other forms of workplace mistreatment and stress.

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## **Appendix: Items in questionnaires**

### **Workplace Ostracism (Ferris, Brown, Berry, & Lian, 2008a)**

5-point scale; never to very often response format;

In the past 3 months, how often have you felt that:

- 1) Others ignored you at work.
- 2) Others left the area when you entered.
- 3) Your greetings have gone unanswered at work.
- 4) You involuntarily sat alone in a crowded lunchroom at work.
- 5) Others avoided you at work.
- 6) You noticed others would not look at you at work.
- 7) Others at work shut you out of the conversation.
- 8) Others refused to talk to you at work.
- 9) Others at work treated you as if you weren't there.
- 10) Others at work did not invite you or ask you if you wanted anything when they went out for a coffee break.

### **Stress (Galinsky, Bond & Swanberg, 1998)**

5-point scale; never to very often response format

In the past 3 months, how often have you:

- 1) Felt nervous and stressed
- 2) Felt emotionally drained from your work
- 3) Felt burned out or stressed by your work
- 4) Felt frustrated by your work
- 5) Found that you could not cope with all the things you had to do
- 6) Felt tired when you got up in the morning and had to face another day on the job
- 7) Felt used up at the end of the workday

### **Self-Efficacy (Chen, Gully & Eden, 2001)**

5-point scale; agree to disagree format

The degree to which you agree or disagree with the following statements:

- 1) I will be able to achieve most of the goals that I have set for myself.
- 2) When facing difficult tasks, I am certain that I will accomplish them.
- 3) In general, I think that I can obtain outcomes that are important to me.
- 4) I believe I can succeed at any endeavor to which I set my mind.

- 5) I will be able to successfully overcome many challenges.
- 6) I am confident that I can perform effectively on many different tasks.
- 7) Compared to other people, I can do most tasks very well.
- 8) Even when things are tough, I can perform quite well.

### **Abstrakt**

*Artykuł ma na celu wyjaśnienie związku między ostracyzmem w miejscu pracy a stresem, ponieważ ostracyzm jest najbardziej rozpowszechnioną formą złego traktowania we współczesnych warunkach pracy. Bada również moderującą rolę poczucia własnej skuteczności pracowników, płci i kultury pracy. Dane zebrano za pomocą ankiety i ustrukturyzowanych kwestionariuszy od pracowników pracujących zarówno w bankach sektora publicznego, jak i prywatnego w Pakistanie. Analiza danych została przeprowadzona przy użyciu technik statystycznych, takich jak analiza bootstraping, test Sobela i analiza regresji. Wyniki badania wskazują, że ostracyzm w miejscu pracy jest pozytywnie związany ze stresem; i poczuciem własnej skuteczności pracowników. Płeć i kultura pracy organizacyjnej ma relację moderującą. Własna skuteczność łagodziła negatywne skutki ostracyzmu w miejscu pracy w postaci stresu, ponieważ samowystarczalni pracownicy zwykle doświadczają mniejszego stresu w miejscu pracy. Organizacje muszą wziąć pod uwagę łagodzący stres wpływ własnej skuteczności, która jest zasadniczo silna dla zapewnienia akceptowalnego działania, ponieważ złego traktowania i niegrzecznych zachowań nie można uniknąć i można im całkowicie zapobiec w kontekście społecznym współczesnego miejsca pracy. Implikacje i przyszłe kierunki badań są omawiane w świetle wyników.*

**Słowa kluczowe:** ostracyzm w miejscu pracy, stres, własna skuteczność, teoria zasobowa, przemysł bankowy, Pakistan, Pendżab

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# Perception of Ability-Motivation-Opportunity oriented HRM practices and organizational commitment: The role of task uncertainty

Michał Ujma<sup>1</sup> , Tomasz Ingram<sup>2</sup> 

## Abstract

*Using the premises of the Ability-Motivation-Opportunity theory, the main aim of the paper is to answer the question of how HRM practices affect individual commitment considering task uncertainty as for the important moderator of the relationships between HRM practices and commitment. For that purpose, we use data from 164 employees working in 32 teams in international recruitment and selection agency departments located in Poland. We find out that HR practices differently affect organizational commitment. In particular, HR practices focused on fostering employees' motivation and creating opportunities within organizations positively influence affective commitment, while HR practices focused on fostering employees' abilities are negatively related to continuance commitment. Further, we also find that task uncertainty significantly moderates the relationship between HR practices and continuance commitment. The study finishes with theoretical and practical implications and future research directions.*

**Keywords:** *ability-motivation-opportunity, AMO theory, HRM practices, organizational commitment, task uncertainty*

## INTRODUCTION

Organizational decision-makers and boards of directors in particular, among others, expect employees to commit to firm performance. However, individual actions rarely lead to above-average organization-level outcomes.

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Collective actions are clearly necessary for firm performance to occur. That is why organizations invest in human resource management (HRM) practices that focus on developing competencies, abilities and motivation, and create appropriate conditions for employee behaviors beneficial for the whole organization. HRM practitioners, trying to justify their value to organizations, invest their time and efforts in developing a concise, holistic set of HRM practices targeted towards achieving organizational outcomes. However, literature recommendations and scholarly activities have so far failed to recommend a universally effective set of practices. While a single HRM practice does not lead to any significant increase in performance levels, scholars have focused on diverse theoretical approaches – including best practice perspective, situational and configurational theories, and finishing with systems' level approach (Delery & Doty, 1997; Pauwe & Farndale, 2017). In 1995, Huselid published a ground-breaking paper demonstrating how a degree of sophistication in a human resource management (HRM) system influences the market value per employee, and the results of this study are constantly discussed in the literature (Glaister, Karacay, Demirbag, & Tatoglu, 2018). While answering the question regarding the influence per se, this study does not clearly explain how precisely HRM translates to organizational level outcomes. In the following years, scholars have focused on investigating mechanisms helping to understand the influence of HRM on organizational performance. Among diverse theories, researchers have recently come to the conclusion that HRM practices should focus on developing individual abilities and motivation and should help organizations to develop conditions that utilize these abilities and motivation for the purpose of organizational-level outcomes. This conception has been labeled AMO (understood as the ability to introduce human resource management policies, the individual motivation to do so, and the opportunity created within the organization (Rauch & Hatak, 2016), following previous studies carried out by Applebaum, Bailey, Berg and Kalleberg (2000) or Boon, Eckardt, Lepak, and Boselie (2018).

Delving into the relationship between HRM practices and AMO, the paper focuses on the HRM practices that concentrate on the development of one particular element of AMO, namely organizational commitment, which is perceived as the manifestation of individual motivation. However, to our best knowledge, the relationship between HRM and AMO does not exist in a vacuum, as there are diverse organizational and task characteristics that impact the effectiveness of HRM practices. From the plethora of organizational, team, and individual situational factors, we have chosen task uncertainty, a rarely investigated aspect of individual functioning within the organization (Sund, 2008). In particular, the main aim of the paper is to gain a better understanding of the influence of HRM practices on individual

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commitment, considering task uncertainty as the important moderator of the relationship between HRM practices and commitment. To achieve this aim, we are using data from 164 employees working in 32 teams in international recruitment and selection agency departments located in Poland.

In the paper, we start with the literature review on the links between HRM practices, AMO theory and its linkages with firm performance. Further, we delve into the task uncertainty effect on the stated relationship. Next, we present the methodology and empirical research results followed by a discussion encompassing the implications for theory and practice as well as future research directions.

## LITERATURE REVIEW

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### **HRM and the firm performance: The missing link**

HRM scholars and practitioners face the continuous challenge of demonstrating how HRM practices contribute to organizational performance (Kehoe & Wright, 2013). HRM, understood as the set of organizational policies crafted in order to maximize employee performance and commitment to meet organizational goals, has a long tradition in management and psychological literature (see Alagaraja, 2012). However, for years, human resource management researchers have struggled to identify the impact of HRM on diverse facets of organizational performance (Melton & Meier, 2016, pp. 118-130). HRM was linked with different individual, team and organizational level outcomes, including job satisfaction (Den Hartog, Boon, Verburg & Croon, 2013), employee commitment and engagement (Bal, Kooij & De Jong, 2013), individual (Alfes, Truss, Soane, Rees & Gatenby, 2013) and organizational performance (Bou-Llusal, Beltrán-Martín, Roca-Puig & Escrig-Tena, 2016, Bryl, 2018), intentions to stay (Bal et. al., 2013) or leave (Van Dierendonck, Lankester, Zmyslona, & Rothweiler, 2016) the team or organization, as well as motivation (Jiang, Lepak, Hu & Baer, 2012) and innovativeness (Fay, Shipton & Patterson, 2015; Tesfaye & Kitaw, 2018) to mention a few. Nonetheless, studies have led to inconclusive results, and in consequence, to increased ambiguity and confusion among both scholars and practitioners (Kehoe & Wright, 2013). This can be attributed to the fact that HRM itself is a distant variable to diverse individual, team and organizational level outcomes. Thus, scholars have focused on various mechanisms that translate HRM practices employed by the organization to fuel diverse aspects of performance (Boxall, Guthrie, & Paauwe, 2016). The search for the mechanisms translating human resource management practices into

organizational performance has gone in different directions. Some scholars were searching for the reasons for exceptional organizational performance in the resource-based theory approach which focuses on valuable, rare, inimitable and organizable competencies (Jankowska, Mroczek-Dąbrowska, Gorynia, & Dzikowska, 2016; Kang, Snell, & Swart, 2012). However, these endeavors have led to inconclusive, or even mutually excluding, results. Another, widely accepted mechanism that forms a path from HRM practices to organizational level outcomes is the AMO theory, which we perceive and define as the ability to introduce human resource management policies, the individual motivation of decision-makers to do so, and the opportunities for employees created within the organization (Rauch & Hatak, 2016). In the paper we focus on the latter approach, concentrating attention on the AMO theory and HRM practices that foster ability, motivation, and lead to increased opportunities for employees to demonstrate behaviors profitable for the organization.

### **On the wings of AMO theory**

The origin of the AMO model lies in the continuous scientific discourse between industrial psychologists, who believe that performance is a function of hiring and training, and social psychologists, who assume that motivation is necessary to ensure performance (MacInnis & Jaworski, 1989). Actually, the roots of AMO can be found in Vroom's (1964) works, where he claims that performance is a function of both ability and motivation. However, this approach omits the external environment influence and focuses only on personal (individual) characteristics. This model was enriched by Blumberg and Pringle (1982) by the opportunity element reflecting working conditions, tools, materials, leader behaviors, procedures and time. These authors argued that individual performance is a result of capacity (C, i.e. abilities), willingness (W, i.e. motivation), and opportunity (O). All three elements are necessary for performance (P) to occur, if we assume that  $P = f(O \times C \times W)$ . Also, a low level of any of these dimensions would strongly, negatively affect levels of individual performance. The AMO framework was first, initially proposed 11 years after Blumberg and Pringle's (1982) work by Bailey (1993), and later developed by Applebaum et al. (2000).

More recently, Kaufman (2015) has argued that in order to achieve better performance, perceived as individual productivity, creativity, and discretionary effort, companies should focus on boosting the ability and motivation of employees while creating opportunities by giving them the necessary autonomy, tools, and power to make decisions. According to Jiang et al.

(2012), these three processes help to translate human resource management practices (or systems, broadly speaking) into organizational performance.

There are also other conceptualizations in regard to HRM practices. Complicating the landscape of AMO, Lin and Tang (2016) argue, that to understand complex relationships between HRM practices and performance, there is a necessary distinction to be made between High Performance Work Systems (HPWS) and High Commitment Work Systems (HCWS). HPWS, as the management approach, focuses on the direct influence on performance through attitudinal structuring, for example, skill formation, quality control, and performance management. On the other hand, HCWS focuses rather on encouraging employee commitment and involvement through practices such as in-company welfare and long-term commitment.

Ability – motivation – opportunity (AMO) theory, as proposed by Applebaum et al. (2000) focuses on helping to choose from HRM practices that foster organizational performance. According to Gerhart (2005) proper choice of HRM practices is essential for the conscious shaping of employee abilities (i.e. selection, hiring, and training), motivation (for example, performance-related pay), and opportunities to act (emphasizing teamwork, or suggestion systems). Later, Katou, and Budhwar (2010) divide HRM practices into three groups: HRM systems that influence ability to perform, motivation to perform, and an opportunity to perform. Finally, in this vein, Rauch and Hatak (2016) systematize and clearly define and distinguish HRM practice into three groups distinguishing: skill, motivation, and empowerment enhancing practices. Skill enhancing HR practices (Subramony, 2009) are aimed at increasing the knowledge, ability, and skill levels within the company, enabling staff to do their job properly. This group entangles two subgroups: HR practices focused on abilities, and that is primarily job selection; and HR practices focused on the development of knowledge and skill, and these can be shaped by interventions, particularly, training and coaching (Schmitt, 2014).

Motivation enhancing practices are, in turn, created to direct employee behaviors towards the aims of an organization by using the appropriate set of inducements. And these practices include, inter alia, performance management, compensation, incentive and reward practices (Jiang et al., 2012). In this approach, it should be noted that motivation-enhancing practices diverge from the organizational behavior literature (Deci & Ryan, 1985), where they focus mainly on extrinsic motivation by the focus on rewards and incentives. Finally, empowerment-enhancing practices are concentrated on developing employee autonomy, involvement into the decision-making processes, and increasing the responsibility of the employees, and feedback mechanisms (Mathieu, Gilson, & Ruddy, 2006; Wood & Wall, 2007).

To sum up, the discussion on AMO theory helps to formulate several implications. First, according to the AMO theory, HRM practices or systems tend to affect organizational performance indirectly, by enhancing individual abilities (or skills), motivation, and shaping conditions for creativity, responsibility, and taking an active part in an organization's life. Second, diverse HRM practices impact different elements of AMO, there are some practices that foster abilities, some focus on motivation, and some are considered to impact organizational conditions. Third, the studies on HR practices perceived as the antecedents of AMO are located at the intersection of management, psychology, sociology, and organizational behavior theories. Fourth, AMO refers to and entails diverse elements, including skills, abilities, knowledge, commitment, job satisfaction, decision-making, empowerment, responsibility, creativity and innovation, and others. It would be extremely difficult to study all the elements of AMO in one study due to the sheer number of diverse manifestations of AMO; thus researchers frequently focus on only one AMO manifestation at a time, for example, satisfaction, commitment, knowledge, decision-making, or creativity. Finally, some of the elements comprising the AMO theory are perceived as an important organizational goal per se. One of them is organizational commitment. In the following part of this paper, we focus on the answer to the question of how HRM practices help to foster organizational commitment, complicating this relationship by adding an important organizational characteristic – task uncertainty.

Based on the above discussion, we believe that there are strong arguments to assume that HRM practices lead to commitment, both individual and organizational. But, diverse HRM practices affect commitment in a different way – there are practices (compensation, incentives, rewards, performance appraisal) that affect commitment to a higher degree than other practices (including recruitment and selection, training, or decision-making possibilities). Thus, we hypothesize what follows:

H1: HRM practices foster the organizational commitment of employees.

H2: Different bundles of HRM practices influence organizational commitment diversely.

### **Task uncertainty: The neglected although influential characteristic of work**

Tasks performed by the employees and individual-level outcomes, including individual commitment, do not occur in a vacuum. There are diverse conditions that affect individual-level outcomes, and one of them is task uncertainty. As Collins and Jackson (2015) point out, increasing complexity and difficulty of tasks implies different approaches in leading employees,

and, by analogy, different task uncertainty levels denote diverse approaches to the management of employees.

Task uncertainty is understood and defined in three terms: complexity, dynamism and the level of routinization, which corresponds to the Ben-Ner, Kong, and Lluís (2012) concept. In general, the construct of task uncertainty has received some research attention in the literature. Gibson (1999) argues that task uncertainty is strongly related to the level of knowledge of the relationships between efforts and actions and their results. It means that task uncertainty is larger when employees are not sure about the future results of their actions. In particular, Cordery, Morrison, Wright, and Wall (2010) tend to link task uncertainty to the lack of predictability between the effort put into a task, processes required to complete the task and its results. Such understanding of task uncertainty is rooted in the changeability of tasks and aims, the quality and availability of resources, lack of support from technological processes, different customers' expectations and market conditions. Their study fits into the research stream of team-based work focusing on the determinants of team performance (Mathieu, Maynard, Rapp, & Gibson, 2008). They concentrate on task uncertainty perceived as a contingency variable, arguing that any management practice focused on the behaviors of employees will promote improved performance differently depending on the level of task uncertainty (Wall, Cordery, & Clegg, 2002). In particular, studying team autonomy (perceived as a result of managerial practice), they conclude that it will interact with task uncertainty in such a manner, that the higher the level of task uncertainty, the stronger the positive impact of team autonomy on team performance, and they find support for their hypothesis on the basis of empirical, longitudinal experimental research.

As Leach et al. (2013) argue, uncertainty comprises of an important contingency in the relationship between work and outcomes, including employee performance and well-being. According to Freeman, Burns, and Stalker (1969), unstable, uncertain and unpredictable work environments require greater flexibility and decentralized decision-making. No matter the source, uncertainty, or differently speaking – lack of predictability in work tasks – represents a key contingency, or moderator, in work design theory (Parker, Wall, & Cordery, 2001). Although uncertainty has been studied as a moderator of the relationship between job control and its outcomes (Slocum & Sims, 1980), it is arguable that individual perceptions of job clarity are highly influenced by managerial practice (for instance, an employee might be entitled to make decisions, but still experience uncertainty in regard to the order of tasks he performs).

To summarize the abovementioned, there are at least three conclusions to be made. Firstly, task uncertainty is perceived as complexity, dynamism, and

the level of routinization. As such, it reflects the very nature of the job. Secondly, similarly to the concept of task environment (understood as complexity, dynamism, and hostility of external environment), it most frequently plays a moderating role in relationships between two variables. Thirdly, there is no denying that task uncertainty affects the individual, team, and organizational performance in such a way, that the higher the level of task uncertainty, the lower the level of diverse aspects of organizational performance. On the basis of the arguments above we hypothesize what follows:

H3: Task uncertainty negatively influences organizational commitment.

H4: Task uncertainty moderates the relationships between HRM practices and organizational commitment.

## RESEARCH METHODS

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An empirical study was carried out in a company that specializes in HR consultancy and delivers recruitment and selection services. The data was gathered between May and August 2017 in 39 teams employing 273 employees in total. A survey was distributed to all employees as well as their managers. We gathered 132 completed questionnaires from employees and 32 questionnaires from managers. There were 29 men and 135 women in the sample. Most of the employees had higher education (124), there were 13 employees with high school education, 26 employees finished postgraduate studies, and one employee had a Ph.D. degree. The majority of employees were employed by the company for less than 2 years (86), 49 employees had an experience of 2-5 years, and 29 employees had been working for the company for more than 5 years.

The research questionnaire was composed of four main parts. The first one reflected the information on the sample and respondents (age, sex, education, work experience, type of activity in the office). It was followed by questions in which respondents were asked to rank on a 7-point Likert scale their assessment of 14 HRM practices, developed on the basis of the Jiang et al. (2012) study, which promote individual abilities, motivation and create opportunities for the development and usage of both abilities and motivation. On the data regarding HR-AMO oriented practices we carried out confirmatory factor analysis, in Mplus 8.2, while there was a theory in this respect that Jiang et al. (2012) clearly assigned HR practices to either strengthening abilities, motivation or opportunities. The model was estimated at the satisfactory level (RMSEA = 0.055, with the level below 0.06 perceived as indicating a good fit, and Compound Fit Index – CFI and Tucker-Lewis Index

- TLI – both reaching levels above 0.9; 0.946 and 0.931 respectively, and that also indicates an acceptable fit). Reliability statistics (Cronbach's alphas) for the isolated factors were as follows: ability (3 items,  $\alpha = 0.717$ ; values of  $\alpha$  if items deleted varied from 0.276 to 0.630), motivation (6 items,  $\alpha = 0.778$ ; values of  $\alpha$  if item deleted varied from 0.651 to 0.774), and opportunity (5 items,  $\alpha = 0.748$ , values of  $\alpha$  if item deleted varied from 0.722 to 0.737). Correlations between items and construct varied from 0.346 (one item slightly below the literature criteria of 0.4) and 0.786. Thus, the confirmatory factor analyses confirmed the hypothesized structure of AMO-oriented HR practices. As a result of our model estimation there were 3 HR practices focused on abilities (recruitment, selection, training), 6 HR practices focused on motivation (including, for example, compensation, benefits, career opportunities, inducements, talent management), and 5 practices focused on opportunities (including information sharing, teamwork, flexible jobs based on roles, performance appraisal with feedback). We treated HR practices as a formative – reflective second level construct, thus we calculated metavariables for all factors identified and we implied they are reflections of HR practices latent construct. We used this approach for further calculations.

Next, respondents were asked to assess their level of commitment according to Allen and Meyer (1990, p. 1-18) conception. The questionnaire was composed of 8 items measured on the 7-point Likert scale. Cronbach's  $\alpha$  for that scale equaled 0.758. In this instance, we carried out explorative factor analysis (KMO = 0.768, Bartlett's sphericity test:  $\chi^2 = 556.478$ , with 28 degrees of freedom, and  $p < 0.005$ ), and it revealed a two factor structure of commitment, namely: affective commitment (5 items, Cronbach's  $\alpha = 0.793$ ), and continuance commitment (3 items, Cronbach's  $\alpha = 0.721$ ). Correlations between items and the scale varied from 0.447 and 0.701 (the literature cut-off line is equal to 0.4 for all of the above). We treated commitment factors as reflective constructs, and we have not calculated metavariables for the following structural equation modeling analysis.

Finally, we have measured task uncertainty using a three-item long questionnaire used previously by Ben-Ner, Kong, and Lluís (2012) in their study. We perceived the items as manifestations of three different aspects of task uncertainty; thus we have not calculated a single meta-score and conceptualized task uncertainty as a latent variable. Such an approach was used for further analyses.

In the study, we used two individual-level control variables, namely the age of the respondent and experience measured as a number of years worked in the organization. We believe that the age of the respondent might be an important control variable while it might be related to the perception of HR policies and practice as well as commitment. On the other hand, experience

in the company should be related to perceived task uncertainty (task uncertainty should be lower for employees with greater experience, while they had an opportunity to familiarize with different tasks and situations).

## STUDY RESULTS

In the first instance, we carried out correlation analyses combined with basic descriptive statistics, namely mean and standard deviation (Table 1).

**Table 1.** Correlations and descriptives (n=164)

	1	2	3	4	5	6	7	8
HR Practices focused on Abilities	1							
HR Practices focused on Motivation	.305**	1						
HR Practices focused on Opportunity	.288**	.558**	1					
Affective commitment	.166*	.430**	.453**	1				
Continuance commitment	-.143	-.042	-.023	.121	1			
Task uncertainty	.045	.065	.140	.136	.198*	1		
AGE	-.108	-.057	-.026	-.046	-.036	.099	1	
Experience in the company	-.185*	-.252**	-.120	-.040	.099	.147	.368**	1
MEAN	4.2886	4.1098	5.3988	4.3415	4.5447	5.1118	3.5	2.4085
STANDARD DEVIATION	1.03354	0.97505	0.87851	1.0234	1.43433	0.90765	1.09936	1.14482

Note: \*correlation is significant at  $p < 0.05$ ; \*\*correlation is significant at  $p < 0.01$ .

Correlation analysis reveals that all three types of HR practices are interrelated, and the relationships are moderate to strong. All three types of practices are significantly related to affective commitment; however HR practices focused on motivation and HR practices focused on opportunities' creation are significantly stronger related to affective commitment than HR practices focused on employees' abilities. Continuance commitment is unrelated to any of the HR practices and neither is it related to affective commitment. Task uncertainty is correlated significantly with continuance commitment. Age of respondents is unrelated to any of the studied constructs,

and experience in the company is negatively related to HR practices focused on abilities and motivation, and it is unrelated to other studied constructs. Finally, age and experience in the company are correlated.

Means of the HR practices focused on abilities and motivation are significantly lower than of the HR practices focused on opportunities' creation. Means of affective commitment and continuance commitment are similar, although in the latter case standard deviation is significantly higher, which means that answers are more diversified. Overall, task uncertainty is perceived as high by the respondents. In most cases, standard deviations are close to 1, apart from the higher level of continuance commitment, which exceeds 1.43. The distribution of the answers is close to normal, except for task uncertainty and HR practices focused on opportunities' creation.

This analysis shows numerous relationships between the studied variables. To understand these relationships to a greater extent we carried out further structural equation modeling in the Mplus 8.2 statistical package. We calculated 3 models. The first one was a basic model comprised of affective commitment and continuance commitment as two dependent variables related to age and experience of the respondents. In the second model, we introduced perceptions of the HR practices (the independent variables). Finally, in the third model, we added task uncertainty (as a latent variable), and we positioned it as a moderator of the relationship between HR practices and facets of commitment. Because of the small sample size, we decided to analyze HR practices as a second level latent construct with three indicators: HR practices focused on abilities, motivation, and opportunities. We calculated the moderation effect for the HR practices as a latent variable that interacted with task uncertainty (also the latent construct). This limited the number of model parameters and allowed it to be estimated normally. Models' estimations are presented in table 2. To estimate parameters in the models we used a maximum likelihood estimator. In all three models, factor loadings were significant at  $p < 0.05$  and exceed the value of 0.5, ranging from 0.506 to 1.375. In respect to a discriminant validity test, in the first instance, we calculated average inter-item correlations within, and error adjusted inter-construct correlations between (derived from CFA model) HR practices scale and commitment scale. Average inter-item correlations for HR practices equaled 0.265 and for the commitment – 0.285. Inter-item correlations between HR practices and commitment equaled 0.193. The value of discriminant validity equaled 0.702, which is lower than the cut-off line 0.85, and this signifies that the two scales measure theoretically different constructs.

The first model was very well fitted. However, analyses revealed that neither of the two control variables explains the facets of organizational commitment. Dependent variables – i.e. affective commitment and

continuance commitment were explained in 0.1 and 1.7% respectively. The second model was also well fitted (see Table 2) and its analysis revealed that HR practices focused on motivation and HR practices focused on opportunities are important predictors of affective commitment. Their influence is positive which means that the higher the perception of HR practices, the higher affective commitment. On the other hand, the second facet of organizational commitment – continuance commitment – was affected negatively by HR practices focused on abilities, but HR practices focused on motivation and opportunities were found to be insignificant in explaining the variation of the dependent variable. This brings partial support for our hypothesis H1, while to some extent HR practices affect organizational commitment, however, some of them affect commitment positively (HR practices focused on motivation and HR practices focused on opportunities), while others affect it negatively (HR practices focused on abilities). These mixed results bring support for our second hypothesis. This confirms that HR practices affect differently diverse aspects of organizational commitment and should not be treated jointly.

In our third model, we tested the moderating effect of task uncertainty on the relation between HR practices and the two facets of organizational commitment. We found that task uncertainty per se does not play an important role in explaining either the variability of affective commitment or the changeability of continuance commitment. Thus, it does not bring support to our third hypothesis. In particular, task uncertainty in the studied company does not affect organizational commitment. However, research results bring partial support for our fourth hypothesis finding out that continuance commitment is affected by the interaction of HR practices with task uncertainty. To gain a better understanding of the moderation effect we prepared a two-way interaction graph (simple slope test, see Figure 1).

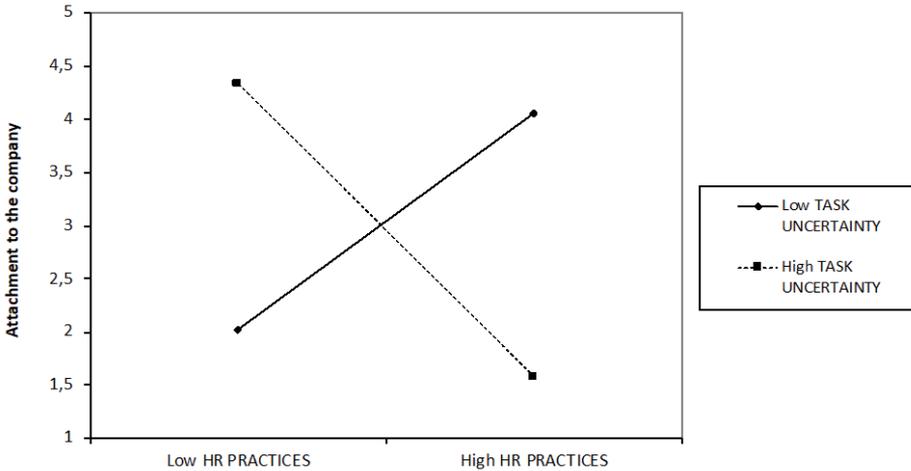
The graph indicates there are different effects of HR practices on the continuance commitment depending on the level of task uncertainty. With low task uncertainty, a high level of HR practices leads to increased continuance commitment. On the other hand, when the task uncertainty is high, a high level of HR practices leads to lower levels of continuance commitment. We discuss this result in the next part of the paper.

**Table 2.** Relationships between AMO-oriented HR practices and commitment in the context of task uncertainty

Model	Model 1	Model 2	Model 3
	Base model: affective commitment and continuance commitment, age and experience as control variables	Relationships between AMO oriented HR practices and affective commitment and continuance commitment	Relationships between AMO oriented HR practices and affective commitment and continuance commitment: task uncertainty as moderator*
<b>MODEL FIT STATISTICS</b>			
RMSEA	0.030	0.038	-
CFI (Compound Fit Index)	0.991	0.980	-
TLI (Tucker-Lewis Index)	0.988	0.973	-
Akaike information criteria	4166.811	4132.034	7069.324
	parameter (p-value)	parameter (p-value)	parameter (p-value)
<b>Affective commitment as the dependent variable</b>			
$r^2$	0.001 (0.865)	<b>0.271 (0.000)</b>	<b>0.441 (0.000)</b>
Respondent's age	-0.027 (0.740)	-0.041 (0.590)	-0.039 (0.606)
Respondent's experience	0.004 (0.955)	0.098 (0.195)	0.084 (0.259)
HR practices focused on abilities	-	-0.014 (0.867)	-
HR practices focused on motivation	-	<b>0.287 (0.005)</b>	-
HR practices focused on opportunity	-	<b>0.402 (0.000)</b>	-
HR Practices (latent variable)	-	-	<b>1.631 (0.001)</b>
Task uncertainty	-	-	0.165 (0.220)
<b>Continuance commitment as the dependent variable</b>			
$r^2$	0.017 (0.414)	0.039 (0.206)	0.096 (0.108)
Respondent's age	-0.107 (0.229)	-0.116 (0.188)	-0.082 (0.347)
Respondent's experience	<b>0.123 (0.151)</b>	0.101 (0.245)	0.096 (0.265)
HR practices focused on abilities	-	-0.168 (0.041)	-
HR practices focused on motivation	-	0.013 (0.907)	-
HR practices focused on opportunity	-	0.014 (0.911)	-
HR practices (latent variable)	-	-	-0.186 (0.539)
Task uncertainty	-	-	-0.044 (0.776)
<b>Moderation effect of interaction of task uncertainty and HR practices (latent variable)</b>			
Dependent variable: affective commitment	-	-	0.090 (0.787)
Dependent variable: continuance commitment	-	-	<b>-1.197 (0.032)</b>

**Note:** significant parameters, with p-values lower than 0.05 are highlighted.

\*For the third model RMSEA, CFI and TLI statistics cannot be computed because of the random type of analysis with an integration algorithm (used for estimation of moderation effects involving latent constructs).



**Figure 1.** The effect of HR practices and task uncertainty interaction on continuance commitment

## DISCUSSION

Our study sheds light on the antecedents of organizational commitment. In our research, the results we received bring partial support for the first hypothesis - we found out that AMO-oriented HR practices affect organizational commitment. In particular, in our study, the affective commitment is, in fact, fostered by HR practices focused on motivation and HR practices focused on opportunities. This signifies that if an organization is willing to invest in HR practices focused on motivation and creating opportunities, employees will be more likely to identify with organizational goals, feel “fitted into” the organization, will be generally more satisfied with their job, feel valued, and act as ambassadors of their organization. In this respect our research results reflect recent endeavors and indicate the potential profits of investing in sound compensation systems (Marescaux, De Winne & Sels, 2013), talent management activities (Chami-Malaeb & Garavan, 2013), or teamwork opportunities created by the organization (Kooij, Jansen, Dikkers, & De Lange, 2010). On the other hand, continuance commitment is negatively affected by HR practices focused on abilities, which signify that the perception of obligation to remain employed in the company is lower among employees who received proper attention during recruitment and selection as well as intensive training. This can be explained

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by the fact that these employees are aware of their competencies which are valuable in the market, and their loyalty is not strengthened significantly by compensation systems and opportunities created within the organization. In this respect, it can be argued that in the studied company the HR practices focused on maintenance (mainly related to compensation, inducements and creating career opportunities) are not perceived as significantly valuable for the employees, and these practices do not affect employees' continuance commitment. This is a contradictory result to the findings of Gong, Law, Chang, and Xin (2009) who found that appropriate HR practices focused on fostering continuance commitment do work. However, we are strongly convinced that the explanation of these finding lays in a moderate perception of HR practices related to compensation systems.

We also found out that HR practices affect commitment in a mixed manner, which is a strong argument for shaping them consciously having in mind the goals the organization is willing to pursue. This is in line with the Kinnie, Hutchinson, Purcell, Rayton, and Swart (2005) findings who convincingly argue for the differentiation of HR practices while they affect commitment in a different manner. In respect to our third hypothesis, we found no support for the argument that task uncertainty plays an important role within this organization. Although there is a relatively high level of task uncertainty perception among employees, it does not seem to affect commitment levels to any degree. This signifies that the level of task uncertainty does not directly influence either employees' affective commitment or their continuance commitment to the company. It clearly indicates that there are other important factors that affect commitment. In particular, in future studies, we argue for considering a conjoint effect of task uncertainty and leadership style, which in our opinion comprises of an important factor influencing loyalty and willingness to stay within the organization (Srivastava, Bartol, & Locke, 2006).

In respect to our fourth hypothesis, we found support for the argument that task uncertainty is a moderator of the relationship between HR practices and continuance commitment. To our knowledge, this is the first study to test the task uncertainty effect on the relationship between HR practices and commitment at the team level. Our research results reveal that the effectiveness of HR practices and its influence on commitment is dependent upon the level of perceived task uncertainty. In particular, with high task uncertainty, HR practices tend to be ineffective in terms of shaping employees' loyalty. Previous studies have already confirmed the differentiated impact of task uncertainty on relationships between organizational phenomena – for example, the relationship between participative intervention and commitment

in the context of different facets of task uncertainty (Sorensen & Holman, 2014), and we believe our research extends this theory in respect to HR practices.

Our study also brings practical implications. In the first instance, it is worth mentioning that managers responsible for HR practices should focus on compensation systems and creating opportunities for employees (for example, career paths, information sharing, teamwork) if they are willing to shape affective commitment among employees. On the other hand, creating a highly-skilled workforce does not always translate into loyalty and perception of obligation among employees. In particular, recruitment and selection practices, as well as the training offered to employees, do not convert into a willingness to stay. To maintain an employee's interest in working for the organization, HR practices should be well fitted together and crafted consciously, which is especially important when bearing in mind low levels of unemployment and the war for talent (Collings & Mellahi, 2009).

The second implication of the study is to focus attention on the level of task uncertainty. While it is not an extremely important factor per se, for organizational commitment, it does interact with HR practices. Our research clearly indicates that in order to maintain an HR practices impact on organizational commitment (in particular, continuance commitment), organizations, leaders, and managers should focus on reducing task uncertainty, while lower task uncertainty levels allow HR practices to positively impact continuance commitment.

In regard to future research directions, we argue that it would be profitable to study HR practices in the context of task uncertainty, similarly, as it is in the case of leadership effectiveness (Parker et al., 2001). This contingency has been mostly missing in studies of HR practices, and it seems to comprise an interesting and significant factor explaining various effectiveness facets. Further, our study encourages further investigations on the mediating role of AMO in translating HR practices into performance aspects. Although there is clear evidence that AMO plays an important role as a mechanism helping to unveil higher organizational performance (Paauwe, 2009), further studies are needed. Next, it would be profitable to test the AMO hypothesis on a diverse organizational level. In particular, we argue that studies carried out simultaneously at the individual, team, and organizational levels of analysis are of special importance for the development of the HR field (Snape & Redman, 2010). Finally, we strongly believe that HR practices should be examined in a broader context. We included task uncertainty as a moderator of the relationship, although there are also other valuable research streams, including linking HR practices with leadership studies (Chuang, Jackson, & Jiang, 2016).

We are convinced that further studies on the relationships between HR practices and organizational performance facets comprise a valuable

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research area. The special role of AMO in these relationships still requires empirical evidence. Our study aimed at filling this research gap by examining the impact of task uncertainty on the relationship between HR practices perception and a single facet of performance – organizational commitment. We believe that further investigations in this regard are necessary.

## **CONCLUSION**

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The search for determinants of different facets of organizational commitment (Bateman & Strasser, 1984; Yahaya & Ebrahim, 2016) has a long tradition and research endeavors have led to diverse, frequently contradictory, conclusions. Understanding the antecedents of organizational commitment is of special research interest since the commitment itself is an empirically confirmed, important determinant of organizational performance (Steffens et al., 2018). Thus, shedding light on determinants of organizational commitment helps to explain distant predecessors of the holy grail of management studies. Our study deepens the discussion on organizational level constructs by explicitly focusing on human resource management practices as determinants of organizational commitment, providing proof that the investment into the HR practices pays returns in this respect. Our study, putting the relationship between HR practices and organizational commitment in the context of task uncertainty, enriches knowledge on when, and in what conditions, HR practices affect organizational commitment. We are convinced our study clearly shows that to understand the basic relationships between the variables in the HRM field, it needs to be studied in diverse organizational settings and, considering the knowledge in the field, that more emphasis should be put on searching for the mechanisms and circumstances in which certain effects take place (Dasgupta, 2016). Thus, this study calls for further research focused on understanding why and how organizational commitment and other dependent, organizational level outcomes are shaped. We argue that the AMO theory is one valuable research path to search for HRM – organizational level outcome explanations.

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### **Abstrakt**

*Głównym celem artykułu jest znalezienie odpowiedzi na pytanie jak praktyki ZZL wpływają na zaangażowanie w kontekście niepewności związanej z zadaniami, traktowanej jako moderator wskazanej zależności z wykorzystaniem założeń teorii AMO. Aby odpowiedzieć na tak postawione pytanie wykorzystano dane płynące od 164 pracowników zatrudnionych w 32 zespołach międzynarodowej agencji pośrednictwa pracy w Polsce. Wyniki badań wskazują, że praktyki ZZL w zróżnicowany sposób kształtują zaangażowanie pracowników, a w szczególności praktyki ZZL zorientowane na motywację i tworzenie warunków organizacyjnych są pozytywnie powiązane z zaangażowaniem afektywnym, podczas gdy praktyki ZZL skoncentrowane na kreowaniu zdolności i umiejętności negatywnie wpływają na przywiązanie do organizacji. Wyniki wskazują również na to, że niepewność związana z zadaniami jest istotnym moderatorem zależności pomiędzy praktykami ZZL a przywiązaniem do organizacji. Artykuł kończy implikacje teoretyczne i praktyczne oraz przyszłe, postulowane, kierunki badań.*

**Słowa kluczowe:** teoria AMO, praktyki ZZL, zaangażowanie, niepewność związana z zadaniami

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