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"EVERYTHING HAS TO BE DONE IN THE POLISH WAY": CREATIVITY BARRIERS EXPERIENCED BY INNOVATORS IN A POST-SOVIET SOCIETY

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Abstract. Innovators from post-Soviet transition societies experience barriers to creativity different from those experienced by inventors in developed countries. Since there has been little research into this subject so far, this article is an attempt to fill this gap. The aim of the study is to explore the mindset and environmental creativity hurdles experienced by Polish innovators as the representatives of post-Soviet states. The data was collected through individual in-depth interviews. Sixteen innovators from Białystok, a city in the Eastern part of Poland, were interviewed. The findings show that innovators experience both individual and environmental hurdles in their creativity actions. In the case of mindset barriers, the feeling of low self-esteem and lack of appropriate knowledge are listed as the most significant barriers, especially at the beginning of the career. The study has shown that although individual barriers hinder creative work, innovators make successful attempts to overcome them. Environmental blocks, however, have the most detrimental influence on innovators' creativity and are the most difficult to overcome. Among these barriers innovators mention the characteristics of *homo sovieticus* mentality, such as informal relations, nepotism, and lack of trust among academics and businesspeople. The study supports the hypothesis that the post-Soviet culture largely determines the low innovation level in Eastern European countries.

Keywords: creativity, environmental barriers, innovation, innovator, mindset barriers, post-Soviet culture.

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1. Introduction

Creativity is an inherent component of innovation. Actually, in the etymological history of the word *innovation*, for centuries these two terms were treated as synonyms (Godin, 2008; Karpińska, 2014). In the literature on modern innovation studies, established by British economist Freeman (1975), it is claimed that creativity is the primary stage of the innovation process (Freeman, 1987; Miettinen, 2013; Novikova & Wiśniewska, 2017). In this paradigm, innovation is defined as a new technological product or service that has been commercialized. Although in the last decade, the notion of innovation has been extended in the discourse of international organizations (Organisation for Economic Co-Operation and Development, 2010; European Commission: Directorate-General for Research and Innovation, 2016) to encompass social innovation, the commercialization requirement remains valid. This entrepreneurial approach to innovation is supported by Wissema (2005), who claims that an idea in itself is nearly worthless, and it only assumes some worth in the phase of development.

Interestingly, Wissema argues that entrepreneurship could be taught as part of university education:

> "Yes, entrepreneurs are dreamers with passion, who pursue their dreams. Anyone who is ambitious, wants to learn and is persistent can become an entrepreneur. It's not magic. You can learn anything as long as you want to" (2005, p. 15), he concludes.

Despite such enthusiastic views on entrepreneurial skills of innovators, their creativity abilities are under-represented as a research problem. Although there are many examples of research projects in the field of creativity studies whose subjects are artists (Manta, 2018; Marnin-Distelfeld & Dorchin, 2020), teachers (Žydžiūnaitė & Arce, 2021), or women-leaders (Mayer & Oosthuizen, 2020), innovators are absent from such analyses, both in innovation and creativity studies. Furthermore, much of the research up to now has been limited to developed economies (Nelson, 1996; Niosi, 2002; Miettinen, 2013), and many of these findings fail to explain the mechanisms that underpin innovators' creativity in developing countries. Though research on the subject of innovativeness in post-Soviet transition economies is growing in importance, the studies are mostly limited to macroeconomic description (Apanasovich et al., 2016; Aven, 1992; Radosevic, 1999; Radosevic & Auriol, 1999). Therefore, it should be emphasized that the present qualitative study investigates the experience of Polish innovators as the representatives of a post-Soviet country.

Since the existing attempts to explore innovators' activity focus on the commercialization process and underplay creativity as the central tenet of innovation, this study explores innovators' experience empirically and argues that innovators encounter barriers to creativity that are insufficiently recognized in the available source literature. By drawing upon previous analyses on innovation and creativity (*e.g.*, Gibson, 2005; Michalko, 2001; Anderson et al., 2014), the present study sets out to answer the research question of what creativity barriers are experienced by innovators from a post-Soviet society. The significant difference between post-Soviet countries and the Western countries provide interesting questions for research on innovation, all the more so because the issue of creativity barriers experienced by innovators from post-Soviet countries is an unexplored research area.

2. Theoretical framework

2.1. Innovation and creativity

This section is a review of theoretical analyses regarding creativity as part of the innovation process, and barriers to invention. While a variety of definitions of innovation have been suggested and there are a number of important differences between them in diverse research areas, *e.g.*, in pedagogy (Žydžiūnaitė & Arce, 2021), economy (Apanasovich, 2016), psychology (Amabile, 1996), and finally, in innovation studies (Godin, 2006), the understanding of innovation adopted in this paper is based on the similarities among them. It is the explanation by Karnowski (2011), who identifies innovation as ideas, actions, or objects which the adopter considers as new. Following this general definition, the result of an innovation is significantly distinguished from the *status quo* (Albers, 2011) and is something that has recently been introduced to the adopter (microperspective) or the industry and the broader community

(macroperspective) (Vesshoff, 2010). In other words, the most important traits of innovations are the novelty and the practical application (the new solution must be used in practice) (Baumann et al., 2016). It must be stressed that the subject or this research is invention in itself, not the commercialization of the new idea. Creativity is perceived here as the first stage of the innovation process, whilst commercialization is the last one. Therefore, in the presented paper, the notion of creativity cannot be used interchangeably with innovativeness. Accordingly, creativity barriers are the obstacles experienced by innovators at the stage of working out new products or solutions.

Creativity is a complex construct and creative thinking has often been mythologized as an inherent ability, a gift (Starko, 2014) rather than being viewed as a cultivated approach to thinking and existing in the world. Although myths about creativity are common in the scientific discourse, empirical research on creativity has expanded since the second half of the 20th century (Runco, 2007). According to Henriksen (2019), much interesting, provocative, critical and sometimes overlooked research on creativity has been located in a range of disciplinary fields, such as: sociology (Loewe, 2010), educational sciences (Gajda et al., 2017), economics (Greffe, 2016), management (Amabile, 1997; Prichard, 2002), philosophy (Gaut, 2010). Overall, a common definition of creativity focuses on the processes of inventing ideas, artifacts, processes and solutions that are novel and effective (J. M. Fox & R. L. Fox, 2019). In this meaning, creativity is action-oriented, which means it does not solely happen in an individual's mind but it also emerges in action. As mentioned by Csikszentmihalyi (1988), creativity is located in neither the creator nor the creative product but rather in the interaction between the creator and the field's gatekeepers who selectively retain or reject original products. But while the aforementioned characterization offers a baseline view of creativity, it tells little about how it happens. Recently, though, the research on creativity has begun to tackle the practical area of creative work. According to Henriksen (2019, p. 218), creativity is a skill, not a talent: "Can you teach creativity? My belief is yes, you can. Certainly. To 95 percent of the population, you can teach it. I get tired of the idea that creativity is something esoteric and elite. It's not". Interestingly, this attitude is similar to Wissema's (2005) opinion about entrepreneurial skills mentioned in the introductory remarks.

It should also be underlined that new ideas are not only essential for individuals but are of paramount importance for entire regions and their culture (Kristeller, 1983). According to Cho et al. (2018, p. 17), "characteristics from a country or region may affect creative classes: in other words, cultural background and regional development level can also generate new creative and cultural industries". In the similar vein, innovators from various cultural backgrounds experience different difficulties resulting, among others, from the history path. As argued by Lundvall:

> "The idea that the aim of innovation research is to end up with general laws that can be applied equally in all national innovation systems is mistaken. There are certain activities that can be linked to innovation […]. But the mechanisms differ across different national systems. This is why theoretical work on national innovation systems cannot dispense from historical analyses" (2016, p. 240).

According to Putnam et al. (1993), where you can get to depends on where you are coming from, and some destinations you simply cannot get to from here. Other words, path

dependency may lead to permanent differences in the performance of two societies, even if the formal institutions (*e.g.*, institutions of the national innovation system) and financial resources (*e.g.*, European Union (EU) funds for innovation) are similar in both.

2.2. Creativity barriers

Generally, in the innovation studies literature, barriers to innovation have been given less attention than innovation drivers (Pereira Cabral et al., 2020). Furthermore, few writers have been able to draw on any systematic research into creativity impediments. However, since a low rate of return on innovation is observed in many EU countries, the so-called efficiency ratio measured in the European Innovation Scoreboard (EIS) statistics (European Commission, 2021), a recent trend is to place innovation barriers at the centre of innovation policy. This attitude is based on understanding which factors out of many issues affecting innovation are the ones that constrain innovation activity (Pereira Cabral et al., 2020). In the literature, innovation obstacles are divided into social, *e.g.*, gender and occupation (Erez & Nouri, 2010), financial (Hölzl & Janger, 2012), knowledge (Pellegrino & Savona, 2017), market (Geroski & Walters, 1995), and regulation (Zehler et al., 2008) ones. Although relatively little is known about creativity problems experienced by innovators, researchers generally divide them into mindset and environmental barriers (Leonard, 2023). The mindset ones are individual personal traits and capabilities (Szambelan & Jiang, 2020). Researchers also classify among them subjective perceptions of the external cultural environment (Leonard, 2023; Aaker & Schmitt, 2001; Loewe & Dominiquini, 2006), *e.g.*, religion (Ngọc Trung et al., 2021), or social stereotypes (Voiklis et al., 2020). Environmental barriers include those that are related to external resources, *e.g.*, financial or legal support (Souto & Rodriguez, 2015). In the presented paper, the researcher's attention lies with the dynamic combination of these two. This attitude is based on Adams' (2001, p. 591) approach, who describes barriers to creativity as "walls that block the problem solver from correctly perceiving a problem or conceiving its solution". Other researchers provide even more detailed classifications of the barriers. Gibson (2005), for example, identifies the following barriers to creativity: personal bias and fear, bureaucratic policies, red tape, and pressure to produce immediate results. While creativity and innovation are associated with positive emotions, such as joy and energy, they also involve a dark side, with fear, anxiety, and anger (Breen, 2004). According to Gibson (2005), fear of failure, decision-making, ridicule, and change is the barrier number one that hurdles creativity. Besides, bureaucracy, century-old policies, and red tape[1] also stifle creative approach since they promote the *status quo* as the safest response to change (Gryskiewicz, 1999). However, leaders apparently sometimes fail to realize that what they do in this context is more powerful than any policy they may make (Gibson, 2005). Therefore, while a corporate culture with a strong entrepreneurial approach encourages innovative attitudes (Howell & Avolio, 1993; Mumford, 2012), creativity is limited by hierarchical relationships manifested in unequal relations, rigid social structure, and authoritarian attitude (Ngọc Trung et al., 2021). In the same vein, Amabile (1996) and An (2019) highlight the role of intrinsic motivation in creative work. They argue that creativity is inspired by curiosity and satisfaction, not by orders and pressure to work on

[1] Red tape barriers include official rules and processes that seem unnecessary and delay results.

demand or produce short-term results. An (2019) points out that intrinsic motivation tends to provide a stronger buffer against unfavorable working conditions resulting from market rules or work-life balance. Some attitudes based on individual beliefs and the social background (*e.g.*, gender) may lead to the lack of collaboration or disproportionate personal ambition (Gibson, 2005; Bennis, 1989).

To conclude, individual creativity is the crucial starting point that exists even in the absence of innovation (Sawyer, 2012). Apart from the impressive scope of financial resources and the number of innovation system institutions designed in accordance with international strategies, creative ideas are born in individuals' minds and the structure of the innovation system itself cannot generate them. Consequently, creativity barriers should be explored from the more humanistic perspective than it has been done so far in innovation studies. Furthermore, much of the research up to now has been limited to developed economies (Nelson, 1996; Niosi, 2002; Miettinen, 2013), and many of these findings fail to explain the mechanisms that underpin innovators' creativity in developing countries. Though research on the subject of innovativeness in post-Soviet transition economies is growing in importance, the studies are mostly limited to macroeconomic description (Apanasovich et al., 2016; Aven, 1992; Radosevic, 1999; Radosevic & Auriol, 1999). Therefore, it should be emphasized that the present qualitative study investigates the experience of Polish innovators as the representatives of a post-Soviet country.

2.3. Polish context

A considerable number of studies on the innovation performance in Europe point to the low positions of the majority of post-Soviet countries (Apanasovich et al., 2016; Wich, 2017; Stojčić et al., 2020; Szopik-Depczyńska et al., 2020; European Commission, 2017, 2018, 2019, 2020, 2021). Poland is no exception in this regard. Whereas Poland has made remarkable economic progress over the last three decades, the current process of catching up is getting more difficult. As a transition economy, Poland has been filling the technological gap by importing know-how and technology, and Polish companies tend to introduce innovative products to a much lesser extent than their counterparts in other countries of the EU. Moreover, countries at a similar stage of economic development, *e.g.*, Hungary and the Czech Republic, have a higher share of innovative enterprises than Poland (Dutta et al., 2021). According to the annual EIS, which provides a comparative assessment of the research and innovation performance of EU member states[2] and selected other countries (European Commission, 2021), in 2021 Poland ranked 24th out of 27 countries and had fallen from the category of moderate to emerging innovators. Only three countries (Romania, Bulgaria, and Latvia) fared worse. Based on the results, the states fall into four groups: innovation leaders (where innovation performance is above 125% of the EU average, *e.g.*, Denmark and Finland), strong innovators (performance between 100% and 125%, *e.g.*, Austria, Belgium, and Estonia), moderate innovators (performance between 70% and 100%, *e.g.*, the Czech Republic, Greece, Italy, and

[2] The performance of EU member states is measured by the summary innovation index, which is a composite indicator obtained by taking an unweighted average of 32 factors, such as human resources index (*e.g.*, new doctorate graduates, population with tertiary education) or attractive research systems (*e.g.*, international scientific co-publications, foreign doctorate students).

Lithuania), and the fourth group – emerging innovators (performance level below 70% of the EU average). This group includes Bulgaria, Croatia, Hungary, Latvia, Poland, Romania, and Slovakia) (European Commission, 2021).

Still, in 2021 Poland performed above the EU average in several aspects, such as the number of people with higher education, the mobility of science and technology workers, or design application. Its best position was in the area of creating an innovation-friendly environment. In this category both factors that were taken into account (the broadband network and the search for and use of opportunities-driven entrepreneurship) were above the EU average (European Commission, 2021). This progress is associated with intensive support for the development of start-ups in Poland and an increase in the share of young entrepreneurs establishing companies (Dziewit, 2021). In most categories, however, although Poland recorded a considerable growth, the total score was still far from the EU average. The number of people with doctoral degrees, the number of foreign doctoral students and employment in innovative enterprises were assessed by far the lowest (European Commission, 2021). Moreover, ever since the first edition of the annual assessment of the European Innovation Index published in 2001, Poland has been below average as regards lifelong learning, public-private co-publications, international scientific co-publications, and research and development (R&D) expenditure in the business sector (European Commission, 2001, 2021).

As a whole, the Polish system of innovation is considered to be *in statu nascendi*: there are many institutions such as clusters or science and technology parks, but their innovative activity mainly involves imitation and is incommensurable with its organizational and administrative base (Osieczko & Stec, 2019). A weak link is observed between academia, business and industrial entities (Mażewska et al., 2021; European Commission, 2020). The existing innovation infrastructure provides the basis for future inventions, yet with respect to universities and their role in linking innovation resources, *i.e.*, infrastructure and human capital with the R&D activity of business, Poland still lags behind the Western countries and is not improving (Miłek & Mistachowicz, 2019). As an aftermath of the socialist period, public national research networks are not competitive for industrial researchers and have a negligible degree of internationalization (Kaliszczak & Rabiej, 2021). In regions with a low level of industrialization, mainly Eastern part of Poland with towns such as Białystok, Olsztyn, and Lublin, faint (and often the only) activity is generated in public institutions (*e.g.*, technical universities and other higher schools). Obviously, there are places in Poland where innovation performance is dynamically developing, but these are scarce cases that occur in huge agglomerations located mainly in the Central and Western regions of the country (*e.g.*, Warsaw, Wrocław, or Poznań).

In fact, in Poland innovative research is mostly conducted by private enterprises – subsidiaries of international corporations (Miłek & Mistachowicz, 2019; European Commission, 2020). Therefore, Polish innovation system is becoming less efficient since it is dominated by global companies, which use the financial support of public policy. Consequently, in Poland the majority of EU funds for innovation have been allocated inefficiently since they mostly supported the initiatives which could have been carried out even without this financing (Okoń-Horodyńska, 2012; Jasiński, 2013; Ciborowski, 2014). Thus such public investments in innovation could be discussed as deadweight loss (Gasz, 2015). As argued by Ciborowski (2014), as the consequences of such policy even higher expenses for R&D will not increase

Polish innovation performance. Zienkowski (2008, p. 25) expresses a similar opinion, concluding that when assuming as the starting point the realistic view of the Poland's situation – relatively low R&D expenditure, especially in the sector of enterprises, the insufficient number of highly qualified research workers and engineers, and hitherto tenuous relationship between academia and business environment – substantial growth of R&D expenditure is unlikely to have far-reaching effects, even if such growth was possible.

3. Methodology

Since the research of creativity barriers essentially recognizes what one believes and how one behaves a qualitative research method based on in-depth, semi-structured interviews was adopted in the study. In the study, a hybrid process of deductive and inductive analysis was applied to interpret the data given the lack of research projects analysing the phenomena of creativity barriers among innovators from post-Soviet countries. Although in source literature there is the universal division of innovation barriers into mindset and environmental ones (Leonard, 2023) it is generalizability is challenging (Amabile, 1996; Anderson et al., 2014). According to Roundy and Evans (2018), inductive research is appropriate when it is not clear a priori what specific issues are important. Thus, the methodological approach integrated theory-driven codes based on the tenets of creativity and innovation studies with data-driven codes.

Purposive sampling was used to select participants from the population of innovators living in Białystok[3], a city in the Eastern region of Poland. The innovators were found through snowball sampling, and data collection was carried out in the autumn of 2021. In this study, an innovator was defined as a person who has developed and implemented at least one new product or service in the last five years, independently or in a team, in cooperation with an institution of the innovation system (*e.g.*, in the form of internship, scholarship, employment, or doctoral school)[4]. Additional sampling criteria used to ensure a diverse group of participants with a range of perspectives included: males and females, from diverse institutions in the innovation system (university, private company, startup company), and with a range of years of experience. In total, sixteen face-to-face interviews (with ten men and six women) were conducted. The relatively small number of respondents partly resulted from the exploratory nature of the research and partly from the planned overall number of interviewees in this qualitative study. As the aim of the research is to seek the creativity barriers experienced by innovators, the small size does not affect the essence of their accounts and thus should not influence the essence of the study (Crouch & McKenzie, 2006). Besides, innovators make a social group that displays some features of a hard-to-reach population (Robins Sadler et al., 2010) and in some respects, it is a limited group. The interviews addressed creativity barriers

[3] Białystok is the largest city in North-Eastern Poland and the capital of Podlaskie Voivodeship. It is the 10th largest city in Poland, second in terms of population density, and 13th regarding the surface area. It has historically attracted migrants from elsewhere in Poland and beyond, particularly from Central and Eastern Europe. This is facilitated by the nearby border with Belarus, also being the Eastern border of the EU, as well as the Schengen Area. The city and its adjacent municipalities constitute Metropolitan Białystok (Wikipedia: The Free Encyclopedia, 2024).

[4] This definition of innovator is adopted from the Organisation for Economic Co-Operation and Development and Eurostat (2018) textbook to measure innovation – *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation*.

encountered by innovators and lasted approximately between 50 and 100 minutes. Interview transcripts were analysed by the researcher without the use of any software. In analysing the data, manual open coding (Quinn Patton, 2002) was used to identify the emerging themes, insights, and understandings (inductive approach), which were then assigned to the previously adopted general types of innovation barriers – mindset and environmental ones (deductive approach). The purpose of this approach usually is to validate or extend a conceptual framework or theory (Quinn Patton, 2002). Open coding (Boyatzis, 1998) was used to create categories in an inductive process of inquiry about the mindset and environmental barriers experienced by the innovators.

The process involved the identification of themes through "careful reading and re-reading the data" (Liamputtong Rice & Ezzy, 1999, p. 258). Following this procedure, 16 codes and 62 subcodes were created. In sharing the qualitative findings, thick description directly stating the interviewees' own words was used so as to allow the readers to understand the author's interpretation and discussion of these ideas alongside the participants' own comments.

4. Results

On the basis of literature review, two areas of innovation barriers were identified: mindset and environmental. In this research, individual difficulties are related to innovators' personal traits such as self-esteem, perseverance, cognitive skills, as well as knowledge (Cardoso de Sousa et al., 2019). Environmental obstacles are related to the interactions of innovators which could facilitate creativity, including aspects such as the workplace, company, academy, and family; broadly speaking, the culture that directly or indirectly contributes to innovators' expression of creativity (Cardoso de Sousa et al., 2019).

4.1. Individual barriers

A recurring theme cutting across the majority of interviews is the pivotal role of self-esteem in creativity. Novice innovators admit they have low self-confidence, which significantly hurdles their creativity actions. Advanced innovators recall similar experiences they had in the beginning of their career. When asked about the most hurdling barrier, the innovator with the longest career said:

> "I would say in the beginning you lack confidence in your own power. Skills are not the problem. The problem is that you don't believe you can do it. Definitely, it's the lack of confidence and fear. Fear that you will fail anyway" [#13].

Some beginner innovators have such low self-esteem that they work alone on their inventions for months, without even sharing that experience with anyone. This attitude is illustrated by the example of a young woman, the author of an awarded orthopaedic innovation:

> "What is the biggest problem? Sometimes it's just that you need to overcome your way of thinking, to believe that you can do something like this, something that people will love. When I got the verdict [...] and I was flooded with awards, I couldn't believe there were so many boards that considered it to be the best solution in the category. So the problem is often how we think about ourselves" [#1].

The fear of not being good enough is also observed among innovators working in a group. Some interviewees admit the source of their low self-esteem is that they tend to compare with other team members, who – as they claim – work more effectively [#7]. One participant mentioned the considerable role her rural social background played in hurdling her self-esteem [#1]. Remarkably, the rest of innovators with the same experience consider this factor as one of the main determinants of their creative attitude [#2, #4, #6, #7, #8, and #11]. As regards other factors lowering innovators' self-esteem, one of the five interviewed women said that gender notably undermined her self-confidence:

> "Actually, I don't have enough self-confidence. Us ladies will never be treated like male science clubs, associating men who don't study at all [...] but get more money anyway. But it is what it is. [...] For some reason, women are not respected so much in technological fields, that's what I think. [...] But I really don't know why. We're not worse in anything" [#7].

While all innovators spoke of the importance of self-esteem in being creative, experienced innovators emphasized the process of building their self-confidence and highlighted the milestones in their innovation career: the moments of being awarded by professional institutions or experts. Innovator #5 illustrates this phenomenon:

> "Of course there were some barriers in the beginning, the issues of where we came from, why, how, and so on. But they always vanished as soon as we began to talk about the subject matter. I think this is the factor that strengthened my inner 'self'. [...] Whether it was in Switzerland, Germany, or elsewhere. I still have relationships with some of those people. You can imagine I turned up there as a student, and we be began to talk seriously about the matter. And that was the moment when barriers broke in those conversations and contacts, week after week they trusted me more and more" [#5].

Along similar lines, interviewee #15 recalls his experience from doctor of philosophy studies in Hong Kong, China:

> "At university, I chose the subject that is the leading one in the world. The guy who taught it, quite famous, said that my reports were the best, and that was because I had gone through a really tough course in all areas of mathematics. [...] Thanks to that, me, a guy from Poland B, was in a class of the man who had worked out the nearest neighbour algorithm, proximity search, and I was at the library used by people from all over the world. I was competing with 30 Chinese folks, who are generally extremely brainy. So it was really important for me, I can still remember this" [#15].

These two cases highlight the importance of knowledge and cognitive skills which contribute to innovators' success. As innovators face the challenge of creating new solutions, they need to be aware of the scientific and industrial efforts in their area. As one participant commented:

> "This is what an innovator is like, someone who breaks advancement patterns. It's like combining different fragmentary solutions in one. That is the moment when real innovation begins, the synergy effect, which is decisive for the effectiveness of the innovator on the market. Because when the innovator only comes up with some ideas but they're unrealistic, impracticable, unrelated to the market, or impossible to carry out, it's not the thing. I know such inventors, for example the man who lives nearby has patented a handle for the national flag" [#5].

As for obstacles connected with knowledge, it is not hard to imagine that experienced innovators face fewer barriers in this area in comparison to beginners. Actually, both academics and company workers underline that they would prefer to follow the leader company in their industry [#2, #5, #9, #14, and #15]. This view was echoed by Tomasz Stypułkowski, the president of the Institute of Innovation and Technology of Białystok University of Technology (BUT), Poland, who explains young innovators' motivations:

> "Their determination results from the fact they want to complete the task, and prove to themselves or to the closest environment in which we all compete that the direction they chose some years or months ago is a good one and will have a good result. So it's more the need to prove that they're right than the conviction that their solution should be applied. I think innovators are not conscious. I'm afraid many things are done by accident, and the results of work on innovation are kind of [...] unintentional" [#3].

Similarly, another participant commented:

> "It's unconscious incompetence, I mean they have no idea that they have no idea. People have no idea that someone has already worked this out, that there are methods and ways to do it, wise books [...]. They really know nothing" [#12].

Only four innovators [#5, #13, #14, and #15] indicated that their competencies related to the way of thinking and the acquired knowledge had been sufficient from the beginning of their career. As one of the most experienced interviewees, the owner of an internationally awarded company, said:

> "How does it start? You just need to be educated in the field in which you want to do something, be aware of the present state of knowledge and technology in that area, and then try out some solutions. You should find out if it's possible to use another approach, to do something more. It's like building a pyramid that you reach when the solutions that are on the market are not enough any more" [#5].

In other cases, the interviewees expressed concerns that they lacked the necessary knowledge.

To conclude, although the theme of self-esteem (well established in literature) recurred throughout the interviews, these findings should not be interpreted pessimistically, since innovators described numerous attempts undertaken in order to overcome these difficulties. In all interviews, innovators underlined perseverance as the most important personality feature boosting their creativity.

4.2. Environmental barriers

Environmental obstacles were expected to be one of the main barriers, and indeed, this was the case for all the participants. A common view amongst the interviewees was that it is very difficult to provide a favourable environment for creative work. What is worth stressing is that the participants on the whole demonstrated the attitude of being responsible for the provision of favourable work conditions. This theme came up *e.g.*, in the discussion of providing financial support for the development of large innovations with uncertain results. The interviewees running their own companies stressed that they had to spend a lot of time doing non-innovative, commercial tasks in order to ensure the stable condition of their companies,

and finally, families. Consequently, only a small fraction of their working time was devoted to innovations. One interviewee reported that he was in a much better financial situation just after graduating from a technical university, when he had participated in many projects in information technology companies. Now, running an innovative company, sometimes he needs to be sustained by his wife, and some of his ideas are loan-financed. It was the case with a vehicle designed to test the condition of road surface. After all, the innovation was not commercialized though the know-how was worked out. As the innovator summarizes his experience:

> "The cost of the vehicle was half a million. I'm still paying back my loan, because I took the responsibility for all that innovativeness. But generally, it's probably something that nobody in Europe has done before. As a young boy with loan money I made the biggest and most expensive device that's ever been constructed. So if I, a boy from Białystok, was able to make something like this, someone who has money can do so much more! [...] But I have to run my business, because otherwise I would have no time to do what I like. I can't work operationally, make money, and be innovative at the same time, because I have to waste lots of time just to make a living, so this is what's killing us" [#15].

Only one interviewee believes that creative thinking is hurdled by the work-life imbalance. That participant, a father of two small children, said:

> "Family is what slows me down, I can't just use a handbrake. Not because I don't want or because my wife says no. It's simply family responsibilities, kids with a runny nose and so on" [#11].

One problem reported by the majority of innovators was the low level of cooperation between science and business institutions. Entrepreneur innovators observed that the University of Białystok, Poland and BUT are at the initial stage of developing innovation culture, though their technological infrastructure is being dynamically modernized. Nevertheless, there were many negative comments about hierarchical relations within the academia, which discourage potential investors from collaboration. For businesspeople, doing business with universities is too time-consuming and unclear, considering the cultural (mainly hierarchical) rules of communication. Obviously, innovators cannot function completely independently and need to cooperate with other private and public institutions. With regard to the latter, however, they are reluctant and sceptical about the effectiveness of cooperation. Indeed, the most acknowledged innovators have created their own systems of innovation on the basis of personal networking [#5, # 14, and #15].

Another recurrent theme, mentioned mainly by academics, was nepotism, which has a significant impact on access to public funds for innovation [#2, #9, # 10, #11, #12, and #15]. The majority of academics described this problem as connected with the lack of transparency in the allocation of financial resources and the attitude of favouritism towards colleagues and family members:

> "Everywhere projects go to the people that are supposed to get them. Not the ones who [...]. I think the construction of science and technology parks or industry parks is kind of establishing artificial relationships between industry and academia. These things are necessary, but unfortunately, as usual, they are done the Polish way. Friends and family are hired first, and only then, specialists, if there are still jobs to offer. And there are some parks, companies and other institutions with a number of really good

> specialists who are doing a good job. But if there were only specialists, those institutions would work much more effectively. So the direction is good, but as I say, it's usually done the Polish way" [#9].

The experience shared by the entire studied group is that the inherent hierarchy of academia had a negative effect on their innovation activity. The influential role of informal relations is often highlighted in innovation studies in the context of networking that involves the exchange of information and ideas among people with a common profession or special interest, usually in an informal setting (Ledeneva, 1998; Mrozowicki, 2011; Novikova, 2015). Nevertheless, a number of studies have reported that a dual pattern of networking is observed in post-Soviet countries: the historically established one based on nepotism, and the newly emerging one based on professional premises (Ledeneva, 1998; Leder, 2014; Novikova, 2011, 2015).

One more common view expressed in interviews by academics was that innovative R&D initiatives are not taken into account in the evaluation of their work because the stress is on the number of articles published in internationally indexed journals [#2, #9, # 10, #11, #12, and #15]. On the other hand, significant academic achievements are crucial in order to obtain grants. This mechanism creates a vicious circle and for many innovators is the obstacle they experience for years. According to a technical university professor with long work experience, this is determined by the mentality of people in the academia:

> "A lot is being spoken [about innovativeness], but the old guard still have the power. They are people who publish for the sake of publishing, so they're not going to allow anyone to stop appreciating them and start appreciating those who implement things. And how does it end? People who work in implementation at universities more and more often quit their jobs and go to industry. The old guard want new ones to replace them, but they prefer their followers, who have been educated by themselves and work the same way. So in fact, the implementations, other things, and scoring at universities are determined by people who have never worked in implementation" [#9].

One of the most striking finding emerging from the interviews is the limited access to infrastructure and technology at the initial stage of innovation. This obstacle was mentioned in each group of the interviewees: students, academics, and entrepreneurs. The theme came up *e.g.*, in the case of the man working on the vehicle for testing the condition of road surface [#15]. The limited access to technology was also one of the main concerns expressed by a student research group working on a specialist wheelchair for a young girl with a disability. Although the students obtained financial support from the technical university, they had many problems with access to proper materials and wheelchair components:

> "There are many technologies that can be used to manufacture such equipment. But we don't have access to them. [...] Now we have a problem with one of the projects. It was to be completed last year, but our frame was being manufactured for three months. The authorities arranged for us to work with a certain company, it was a spin-off at the technical university. They promised to make the frame for us at cost. We paid a great lot for it and it was not made in accordance with the design. Not at all. Not even from the proper material. [...] The frame was to be made of aluminium but has been made of high pressure steel, so its mass is completely different from what was assumed. [...] Well, they were some acquaintances of the university authorities and they promised it would be done properly. They just took it, did it as they wanted, and said farewell. I suppose it will just be a prototype. I don't know if the girl will be able to use it. I'm not sure, but I think it will be hard for her to push it" [#8].

These results are in line with a case study on barriers and drivers of innovation in higher education carried out across ten European universities, in which Lašáková et al. (2017) found that a key difficulty for innovators was the access to modern technology infrastructure.

The case described above reveals a few obstacles experienced by innovators, as the limited access to technology is just the tip of the iceberg of the specific culture at many Polish universities and their spin-off companies (Karpińska, 2020). Some of the interviewees described the culture as typical of post-communist countries, where the characteristics of *homo sovieticus* mentality (Novikova, 2011, 2015) are still common:

> "It seems to me that Podlasie is an ever more backward part of Poland, and Poland used to be part of the Eastern bloc. We have this Russian saying that the quieter you are, the more you'll achieve. You should not stand out and have your own ideas, just do what the boss tells you, and so on. Although this attitude has already disappeared to a great extent, it still exists in companies operating for 30 years, or in public administration. Even if young people have the power, the hierarchical and feudal system in public administration simply hibernates and freezes the past, the form changes but actually, it's still the same" [#5].

The hierarchical relations, processing the things via informal connections and doing tasks for the sake of doing them, irrespective of their effectiveness, are observed by the majority of the innovators. The following quotes illustrate this pattern:

> "It must be one of us. That's all. It doesn't have to be a member of family, but it must be one of us, whatever that means. […] In the past, if you had an excellent work appraisal, you received higher pay rises as an incentive. But once it was found that some people were awarded though they shouldn't have, this principle was discontinued. And since then on, pay rises have been totally discretionary. So now you may even work very well and have very good evaluation, but it has no influence on your earnings. It doesn't matter what you do. This is the price of innovation […]" [#9].

One of the innovators straightforwardly called the mentality of both local academics and businesspeople as the peasant state of mind:

> "Mentally, our university is still in the period of communism. We have the worst practices of mobbing, vilifying, deceiving people, and forcing the younger ones to give their signatures. It's so silly, for example when I asked for 7 thousand zloty for my research, they told me I wouldn't get it because I didn't have any publications with the university affiliation. And how could I have them since I was new there? I had just been employed […]. If you give me money for research, I will give you publications, not the other way round. […] In my opinion, there's nothing wrong with coming from a rural area generally, but as for those people, I would just call them peasants. I mean the lack of trust, that ridiculous system, that instead of making an agreement for the good of the region, they prefer to fight" [#15].

Among the attitudes experienced by most interviewees was also the feeling of distrust towards other individuals and institutions involved in the innovation process. Academics do not trust businesspeople, entrepreneurs are suspicious towards university researchers, and neither group trusts state officials:

> "I went to the Economic Forum in Karpacz to present our subject last year. It was not me who presented the subject. The cluster presented it in my behalf, and I was told all the time: if you speak up as [the name of the company], nobody will take any notice of

> you, they'll ignore you, because it's just a private company that nobody knows. This is how private companies are still treated in Poland. They are accused of all possible evil, starting with corruption. If you're rich, you're a thief, that's obvious. And as soon as you earn some money, you will buy a fifth Mercedes, a second helicopter, or something like this. It's so absurd" [#5].

According to the interviewees, overwhelming omnipresent suspicion is the dominant pattern of relations among innovators. However, while unofficial ties played a positive role in sustaining the economic system during the Soviet period, after the transformation stage, these practices were carried out "with no control of their negative aspects and no attention to their advantage sides" (Ledeneva, 1998, p. 182). As Novikova (2011) points out, in normal (understood as capitalist) business practice, attempts are made to avoid informal practices that are subversive and follow supportive ones that channel important information. One of the innovators expressed it this way:

> "The lack of trust is the remains of the communist period. But another thing is that we are highly skilled in acting in unclear conditions. [...] We have the predispositions, only we have to learn to cooperate. In the West this is nicely called 'networking', but here it's still called 'inside contacts'. And we still have the old times on our minds, thinking that if we use inside contacts to achieve something, then it's wrong. I think this is connected with our mental level. After all, all the occupations and wars have decimated our elites. I think this applies to the entire nation, but here in Podlasie it's even worse, because the Russians were more aggressive here and the results are much worse" [#15].

Taken together, the results suggest that there is an overwhelming feeling of social distrust among individuals involved in innovation. Furthermore, it can be generalized that distrust is the fundamental social feeling permeating the Polish society in general (Leder, 2014, 2022), since the results of this study provide insight into the society where distrust makes people count only on what they actually have now and treat any promises or assurances with great caution. According to Andrzej Leder, the Polish society is double-tongued, *i.e.*, what you say may not be what you really think, which is a feature of feudal, highly hierarchical societies, with huge differences between the strong and wealthy ones with authority and the weak majority. This mechanism generates the rule of distrust instead of trust. "Many Poles think: 'What others say does not really matter. We must look realistically at what we have'" (Leder, 2022, p. 22).

Overall, the culture of innovation described by the participants is based on the post-Soviet pattern of nepotism and lack of trust among individuals and groups involved in the innovation process. A common observation experienced by the interviewees was a very deep division between the ones who have the access to resources (financial, technological, know-how) and those who do not. No other divisions (experience or specialization) were of any real importance.

5. Conclusions

The specific objective of this paper was to discuss creativity barriers experienced by innovators which are not sufficiently captured in the existing literature. Hindrances suggested in the literature review were broadly divided into mindset and outset (Soriano de Alencar,

1999). In this respect, the findings of this study partially overlap with the creativity barriers classified in other fields (*i.e.*, art or pedagogy) (Manta, 2018; Žydžiūnaitė & Arce, 2021). From the perspective of an individual, innovators experience problems with self-esteem but make many attempts to build their self-confidence on the basis of the acquired knowledge. Regardless of age, gender, workplace or social background, innovators' self-esteem is crucially determined by their expertise and know-how. In order to combat individual creativity barriers, the participants demonstrated an active attitude of lifelong learning. These results are in line with the results of previous research of creativity (Loewe, 2010; Amabile, 1996). However, the most significant finding to emerge from this study is that environmental barriers are the most hurdling obstacles innovators experience. To put it simply, the culture is more likely to engender learned helplessness than to create a sense of empowerment. This observation may support the hypothesis that the post-Soviet culture determines the low innovation level in Eastern European countries. Furthermore, the research has also shown how demanding it is for innovators to overcome these cultural obstacles. Indeed, in many cases, interviewees' attempts to change or just go through the *status quo* were fruitless, though very absorbing. Nevertheless, it should be emphasized that the strongest driving force for innovators is a change in their own state of mind: this is the source of energy that motivates individuals to be creative. The results of this study clearly show that innovators are aware of the façade mechanisms of the network and information systems, *e.g.*, in the case of administration of funds for innovation, and do not want to participate in it. Instead, they are so focused on achieving their individual goals that they try to organize an innovation-friendly environment as autonomously as possible.

To conclude, while it has long been recognized that attitudes towards innovation differ markedly in developed economies with similar beliefs and values (Miettinen, 2002; Lundvall, 2016), understanding this phenomenon among post-Soviet countries is a more recent research approach (Radosevic, 1999; Radosevic & Auriol, 1999). This study is a contribution to that research approach in that it explores what issues determine a number of tensions that lie in the business and academia context. Although this result seems to be consistent with other studies which have found that creativity barriers are strongly determined by the level of social capital and path dependency of the society (Lin, 2003), studying the barriers experienced by innovators from Eastern European countries is an emerging approach, so far neglected in the discourse of creativity and innovation studies. In the context of a new public management approach according to which innovation policy is benchmarked against Finland's success story in the entire European community (Mytelka & Smith, 2002; Miettinen, 2013), this research has different implications. In-depth understanding of the post-Soviet mentality that manifests itself as barriers to creativity may provide a better understanding of potential obstacles in creating an innovation-friendly environment/culture in this region. The present study also lays the groundwork for future research into the role of human reflexivity (Archer, 1996, 2000, 2003) in overcoming creativity barriers. This humanistic approach will provide greater insight into the subtleties associated with innovators' agency in relation to how they consciously organize their career patterns and react to complex social, mainly cultural, system limitations.

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