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# Young leaders as implementers of neuroscience innovations in family food businesses

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## ABSTRACT

Neuroscience and its implementation in work with human resources is an important part of managerial work. It helps to understand people and the processes of motivation, learning, and adaptation to new situations and reactions to changes in human resource management. Implementing new trends in work with human resources is also very important for ensuring the sustainability of family businesses as an irreplaceable part of national economies. Their implementation is helped by the fact that many of the family food businesses are going through the process of generational change, and family business leadership is being taken over by a generation of young managers - leaders. The contribution aimed to discover how the younger generation of managers perceives neuroscience and where they see the opportunity for its application in human resources management. Our research focused on the younger generation of managers -leaders in Slovakia's small and medium-sized food family businesses. A structured controlled interview was used for qualitative data collection, which was statistically evaluated using the Text mining method. As we discovered, some new neuroscience-based practices are already gradually being applied. By focusing our research also on a different view of the implementation of neuroscience into managerial work by gender, the conclusion is that female, young managers focused on using neuroscience to improve the working environment and in the area of human leadership. Young men as managers, were more focused on the growth of employees who already work in the company to be even more efficient and better manage the learning process. It is a very positive finding that young managers of small and medium-sized food enterprises in Slovakia have already begun actively introducing innovative methods of working with human resources using neuroscience knowledge.

**Keywords:** neuroscience, human resources, young manager, SME

## INTRODUCTION

Despite the frequent belief that managers make decisions based on facts and logical arguments - their decisions are based on their unconscious feelings. Brain aims to look for patterns and automatize human decisions and actions **[1]**. Due to new trends in direction and management, defining the present quality manager's profile is necessary. One of the common problems in managerial work is the so-called student syndrome. Student syndrome is an unexpected and surprising delay in performing managerial tasks. It is based on a typical student problem – postponing uncomfortable learning and last-minute work before the exam.

On the other hand, it emphasizes vigilance and attention to mindfulness, which is based on not dealing with details, but maintaining insight and perception of ourselves and the situations in which we find ourselves **[2]**. Mindfulness is an approach carried out by meditation, which aims to appropriately draw attention to the status quo. Neuromarketing research recommends practicing mindfulness because it affects brain structures and functions. Mindfulness practice focuses on brain networks related to emotion regulation, self-recognition and attention **[3]**. Dr. Rock created the SCARF model to improve relationships between managers and employees.

SCARF is an acronym for the five social qualities with which this model works: S – status, C – certainty, A – autonomy, R – relatedness, F – fairness **[4]**. This model is based on research that suggests that the brain always tries to minimize threats and maximize benefits. It is based on brain activity, uses cooperation and the influence of others. It outlines several domains of human experience, such as condition, certainty, autonomy, connection or justice, around which our perception activates different brain regions. This determines how individuals respond to rewards or threat **[5]**. Using neuroscience, the manager can learn more about creating change, controlling learning, controlling learning, and understanding moral reasoning **[6]**. The techniques used in neuroscience help to understand employees. This makes employee satisfaction and performance identifiable **[7]**. However, it is important to remember that even in neuroscience, there is no one size fits all approach. Different cultures, communities, and different demographic groups of employees will respond differently to the same stimuli **[8]**. Research has shown that there is a significant difference between the academic definition of work assignment and its practical application in enterprises **[9]**. Businesses should carefully handle so-called mental motivation, as this can significantly impact employees' internal motivation **[10]**.

In our research, we focused on how young managers (under the age of 30) of small and medium-sized food family businesses in Slovakia perceive innovative approaches in human resources management with the use of neuroscience. We were also interested in the difference in perception of these approaches based on gender. We paid attention to the perception of neuroscience by a new generation of managers who were personally and professionally brought up in the market economy and are not significantly influenced by Slovakia's former centrally planned policy. Based on several published sources, we assume that they are the ones who can correctly implement new methods from human resources management using neuroscience knowledge.

While business research and scientific research adhere to high ethical standards, using neuroscientific methods involving the human subject raises various ethical issues that business scientists need to be used to **[11]**. Neuroscience is a science that deals with examining the nervous system **[2]**. To understand the functioning of nerve cells and brain, it uses approaches of anatomy, molecular biology, mathematical modelling and psychology **[12]**, **[13]**, **[14]**. It also examines nerve tissue relationships and individual behavior **[15]**.

Human personality can perceive their environment and absorb a lot of information. Scientists have discovered more about neuroscience and brain functioning in the past 10 years than they have since the beginning of human existence. People needed less information in the past, but as time progresses, we need more information today **[16]**. There has been tremendous progress in understanding basic brain processes in management, marketing and consumer behaviour **[17]**. One of the most important neuroscience knowledge areas is that the brain constantly changes in use, depending on the learning processes **[18]**. The brain is programmed to survive. He responds to social threats in the same way as physical threats – he tries to avoid it. When assessing whether a situation is dangerous, the brain trusts past experiences. In response to social threats, the brain creates so-called avoiding emotions – e.g. fear, anxiety, anger and shame. Thanks to such emotions, it prevents the threat. Possible responses are defense, attack, and departure. Conversely, when the brain evaluates the situation as "safe", it generates so-called approach emotions such as trust, enthusiasm, joy and love. These emotions are a prerequisite for successful project implementation, enabling cooperation, creative problem solving and rational decision-making **[19]**. So far, economic theory has assumed that a person is happy when he gets what he wants, the more, the better. However, neuroscience has shown that the "emotional brain" quickly gets used to new stimuli and calls for new and new stimuli. This explains why happiness levels in developed countries do not rise proportionally with rising living standards. Not the level, but the change is important **[20]**. The human brain has two ways of thinking: fast and slow **[21]**. Fast thinking is an automatic fast operation with little effort and no sense of voluntary control.
On the other hand, slow thinking uses much energy – which means that the brain does not want to use it unless necessary, but it is very good when solving complex problems **[22]**. Slow and fast thinking may not always work independently of each other. Indeed, quick thinking constantly creates suggestions (e.g. impressions, intuition, intentions and feelings) that slow thinking considers and confirms. Slow thinking is part of controlled processes be-cause (e.g. text learning, financial market analysis) it requires awareness, concentration, effort and deliberate action **[20]**. According to Dr. Davidovich, applying basic neuroscience knowledge to business is a breakthrough in improving the organization’s performance. It helps individuals better understand what is happening in their brains and provides approaches that can help deal more effectively with people and create sustainable change at the level of individuals and the whole organization **[23]**. By applying neuroscience to management, neuromanagement is created. This can be described as the art of human resources management to achieve better organizational performance **[24]**, **[25]**. It contributes to better relations between managers, employees, teams, partners, idea-making and their implementation into business practice **[26]**. Neuroscientific studies show three of the most important principles: 1. understanding the learning and re-learning process and how to manage it successfully; 2. redefining the resistance, how to identify its different types and how to overcome it effectively; 3. Facilitating the adoption of changes **[27]**.

**Leading people:** There is a relationship between the level of intelligence and the type of guidance **[28]**. Self-awareness and self-control are fundamental requirements for sustainable organisational leadership **[29]**. Leadership is becoming more and more important in organizations and team management. Neuroscience can provide many insights into how leaders can be more efficacious **[30]**. The neuroscience perspective also has some important implications on the links between leaders' emotional intelligence and followers' results through the innovation process **[31]**. Neuroleadership is as an application of neuroscience knowledge to leadership and neuroscience can be used to educate new leaders **[32]**. Neuroscience studies could advance research on entrepreneurial leadership because it explores the neurophysiological substrates of mental processes and corresponding behaviors **[33]**. The Entrepreneurial Leadership represents one of the most important fields of innovation management that has become increasingly multifaceted and interdisciplinary with its evolution **[34]**. This concept is a crucial aspect in all the organizations that deal with innovation management strategies as the study of neuroscience can also support the study of the emotions and cognitions of leaders. Zwaan et al. **[9]** found that neuro leadership impacts employees' workload and is one way of increasing the workload. Neuroleadership improves work engagement through psychological, neurobiological, sociological and organizational dimensions **[9]**.

**Neuroscience in employee education:** Self-awareness is needed in the development and education of employees, i.e. a realistic assessment of employees' abilities because development and training respecting the authenticity and characteristics of the person can produce significant results if the principles of neuroscience are naturally applied **[35]**. The neuroscience-based learning approach attempts to create new brain patterns of subconsciousness, which require time to be built and strengthened **[36]**. Key teaching practices supported by neuroscience:

- An experience-learning environment that allows people to get into a "flow" of deep engagement and creativity. According to neuroscience studies, learning is most effective when an individual is in positive emotional state **[36]**.
- Active learning – a cognitive process that involves three parts cerebral neo-cortex (evaluation and analysis), hippocampus (consolidation of information from short-term memory to long-term memory) and amygdala (helps the brain to identify the main points of new inputs) **[36]**. In active learning, teachers act only as knowledge-gathering intermediaries, not as their one-way providers **[37]**, **[38]**.

Economic and educational activities indicate that the human brain is actively involved in the economy and educational processes and controls human behavior. Modern neuroscience helps to understand what is happening in the human brain and how internal mental processes can affect human skills and behavior **[39]**, **[40]**. The brain controls our thinking, learning and memory **[41]**.

New concepts are emerging – neuroeducation and the so-called "brain learning theory". Neuroscience is a new discipline that proposes to take over knowledge from neuro-scientistic techniques to improve learning processes and thus optimize learning **[40]**. The essence of "brain learning theory" lies in understanding why and how learning takes place and how teaching and learning should be as successful as possible. The results led to the idea that learning should be placed in the brain, or the activity of learning attributed to the brain **[42]**. Classical learning usually does not lead to better organizational performance, because people will soon return to the old ways in which they did things. Learning based on the principles of neuroscience is based on stimulation of dopamine centers and active participation of participants **[43]**. Dopamine is a so-called neurotransmitter – generating positive emotions, self-esteem and energy **[20]**, it manages positive strengthening and motivation **[44]**. According to experts, roughly 20 days a month is needed to turn newly learned behavior into a routine (habit) and the brain has accepted behavior as its own **[43]**. Today, the latest neuroscience research and behavioral approaches are increasingly coming to the awareness of company management through trainings, workshops and presentations. They can directly apply project management tools to effective project management and complex tasks from a unique neuroscience perspective. Above all, it is about eliminating stress, more effective solutions to operational tasks and problems, or better adaptability to change. New possibilities and inspiration include an out-of-box view, initiative and activity, or a better working environment – a better atmosphere and joy of work **[1]**. With learning strategies ranked from least to most effective by cognitive neuroscience: images to text; keyword–mnemonics; summary; word highlighting; re-reading; self-explanation; text listening; exercises; practice; practical testing **[45]**. Most individuals and organizations worldwide are trying to get the most out of their educational programs. But they must change some initial understandings about it to increase learning effectiveness. Research shows that to adopt information with a long-term effect successfully; it is much more beneficial to spread education into several study blocks. The latest neuroscience findings have been summarized in a four-phase model that ensures that learned things are not forgotten – ages: attention, generation, emotion, sleeping **[46]**, **[47]**.

**Stress in the workplace:** Stress, health or arousal are often studied to understand various other phenomena. Most studies use measures of the autonomic nervous system or biological indicators of various physiological

subsystems such as cardiovascular, metabolic or immunological **[48]**. If the brain gets into stressful situations, logic is immediately switched off and passes into subconscious and instinctive functioning **[16]**. The mindfulness method has also shown a modification of some physiological indicators associated with stress response, such as cortisol release and change in heart rate **[49]**. Mindfulness can demonstrably reduce employee stress levels and increase personal empathy **[3]**. A positive approach brings up to 23% higher energy levels under stress, 31% higher productivity levels, 37% higher sales levels, 40% more likelihood of promotion and 3x higher levels of creativity **[35]**. When you feel physically or socially threatened, cortisol is released, which affects your creativity and productivity. We literally can't think **[50]**. Symptoms of stress in the workplace include depression, fear (panic attacks), difficulty sleeping, loss of interest and motivation, forgetfulness and poor concentration. In 2015, the work-life balance ratio for employees in Slovakia was worse than the sample from all over the EU **[49]**. According to Aboiron, leaders must cultivate a healthy corporate culture by stimulating beneficial neurochemicals in the workplace. Although this needs to be done individually, the collective stimulation of Oxytocin and Serotonin in each employee collectively cultivates a good and healthy corporate culture in these conditions, employees are not under much stress and know their leaders have a higher acceptance of failure or mistakes. With a proper mindset and attitude, an employee can carry out tasks more effectively **[30]**.

## Scientific Hypothesis

Young managers of family food businesses perceive neuroscience in HRM positively and are also ready to implement it in business practice. The topics that young managers of family food businesses deal with in the field of neuroscience in HRM are different from the topics that female managers deal with.

# MATERIAL AND METHODOLOGY

## Samples

The contribution aimed to evaluate the approach of the young generation of family food business managers - leaders in Slovakia- to the potential use of neuroscience in working with human resources. The research was focused on the younger generation managers of small and medium-sized family food businesses in Slovakia. The reason was that many of the family food businesses are going through the process of generational change and a generation of young managers is taking over family business leadership to ensure sustainability. Implementing new trends in work with human resources should be helpful in this difficult process.

## Description of the Experiment

**Sample preparation:** The stated condition was: that the respondent is a manager in a food family business in Slovakia. As a criterion for classing a business as a family business, we were based on the definition of Poza and Daugherty **[51]**, who claim that a family business is a business in which family members have ownership. The survey involved 134 respondents (80.5% female managers and 19.5% male managers). According to Wilson et al. **[52]**, there are more managers in family businesses than in nonfamily businesses, which may cause them to be more represented in research. Our results do not correspond to Furik, who claims that there are 35% of female managers in the world, but our sample corresponds to the assertion of Meroño-Cerdán and López-Nicolás **[53]** that women work more often in managerial positions in small family businesses.

**Number of samples analyzed:** The structure of the respondents was:

- Total number of respondents: 134.
- Man: 26.
- Woman: 108.

**Education:** Managers' education was irrelevant to our research.

**Questionnaire preparation:** Number of questions analyzed: 2 identification questions, 2 closed scale questions, 1 open question.

- Questions: 1. Respondent's gender (male, female), 2. Were you born between 1985 and 2000? (Yes No), 3. I perceive neuroscience in HRM positively. (Agree, Disagree, Don’t know), 4. I am ready to implement neuroscience in my business practice. (Agree, Disagree, Don’t know), 5. In which topics of HRM do you see the application of neuroscience? (Open question).
- Conducting a questionnaire survey: The survey was conducted between October 2020 and December 2021. Since there is no database of family businesses in Slovakia, we searched for businesses in the finstat database and based on the matching of surnames in the administrative authorities in the commercial register, we tracked down their contact details on their websites. To cooperate on research, we identified and then contacted 186 companies electronically. Of them, 134 agreed to cooperate, whose answers we further processed.

**Number of answers:** 134

**Creating a dataset:** The respondents' answers in electronic form were translated into English as an unstructured text. Subsequently, the responses were encoded in MS Excel according to the requirements of the Text Mining method **[54]**.

**Processing the answers:** We performed data extraction through Statistica and Data Mining. For a higher denunciation value, we have chosen a TF-IDF function that revealed the importance of individual expressions in respondents' responses **[55]**. We extracted the terms into concepts and decided to work with the first two concepts with the highest termination value **[56]**. Based on singular values, we displayed extracted concepts in a scatter chart **[57]** where we focused on extremes. Individual groups were formed based on the gender of the respondents and the terms most frequently used by them (focused on extremes). Groups 1 and 2 determine the extremes in the responses of young female managers, and groups 3 and 4 determine the extremes in the responses of young male managers.

**Number of repeated analyses:** 0.

**Number of experiment replication:** 0.

**Design of the experiment:** The survey was conducted between October 2020 and December 2021. We chose short questionnaire for collecting quantitative and qualitative data. Structured interview was chosen as a qualitative data collection method, which were statistically evaluated using the Text mining method. Qualitative research **[58]** was devoted to analyze the issue deeply. At the beginning of the research, we gave a lecture on "Neuroscience in the work of the manager", which was provided to all respondents in video form throughout the research. It lasted about 30 minutes and contained basic information and options for using neuroscience in HRM. The lecture was sent to respondents along with an online questionnaire, where we focused only on the gender of the respondent. The questionnaire was started with the question, “where do they see the use of neuroscience in human resources in their family business”. They should have prepared their answers based on the problems they often face. We evaluated the responses using the Text Mining method.

## Statistical Analysis

Based on data from the questionnaire, analysis of dependence was performed by $\chi 2$ test. The p-value for the $\chi 2$ test was compared with alpha = 0.05. If the p-value exceeds alpha, there is no statistically significant dependence between the categorical variables. If the p-value is lower than alpha, a dependence exists, and its tightness was verified by Cramer's V – coefficient, which takes values from the interval <0.1>. Values between 0 and 0.3 indicate weak dependence, values between 0.3 and 0.8 indicate moderate dependence, and values between 0.8 and 1 are classified as strong dependence between the studied traits **[59]**.

## RESULTS AND DISCUSSION

Human beings are embedded in various organizations. Organizational cultures can promote prosocial behaviors such as trustworthiness or antisocial behaviors **[60]**. Success in any organization may depend on changing the behavior of stakeholders to meet new challenges. But humans have brains designed to register change as a threat; thus, they often cling to old habits and mindsets. Recent breakthroughs in brain research provide a fresh alternative to both behavioral and humanistic approaches to organizational development. Neuroscience principles are now transforming leadership in business enterprises, and these concepts have relevance to any organization or program **[61]**.

Despite increased attention on neuroscience discoveries and its methodologies in the social sciences, there need more research among HRD scholars incorporating neuroscience approaches. Relatedly, HRD practitioners and scholars often view reflection as critical for developing human resources and leaders **[62]**. The special province of coaching a leader using applied neuroscience understands that perception controls create the neurochemistry that controls behavior; the leader can quite easily understand how his or her brain functions. Concepts of leadership have typically been founded on masculine models. Pragmatic business leaders generally love seeing knowledge turned into added value. Leaders thereby make sense of their own behavior and can direct attention to what is significant in the observable decision-making of others. Trust is the interrelationship mechanism by which others’ energies will flow in the direction the leader wishes them to flow **[63]**.

According to Berčík **[64]**, neuroscience is gradually coming into the attention of Slovak companies. Also, Smerek **[65]** states that new approaches to human resources management (including neuroscience) are gradually being introduced in Slovak companies. These draw attention to the perception of human resources as their most important input. One of the **[66]** research findings is that people can consciously change and even overcome their instinctive responses to those that will be more effective for them. When things around us change, it's an opportunity to create new habits that will help us to respond better and manage new environment **[67]**. According to Teacu et al. **[26]**, new approaches with neuroscience knowledge can bring creative changes and innovative ideas that can turn economic mechanisms into more efficient ones. Also, Bilevičienė et al. **[68]** wrote that we can

make the business more efficient by applying innovation management principles and managing human resource management changes. For example, the neuroscience research of Hills **[69]** explains how we can better implement talent strategy and why adopting certain policies will get the business better results. By applying the ideas in the article, talent leaders can be more successful in executing their talent strategy and meeting business goals.

Grzywacz and Smith **[70]** wrote suggestions for promising research areas wherein family scientists and social neuroscientists could build collaborative research to address gaps in the work–family literature.

On the base of the aim of contribution "to evaluate the approach of young generation of family food business managers in Slovakia to the potential use of neuroscience in working with human resources" a questionnaire was applied which started by the question "where the young managers in small and medium-sized family food businesses in Slovakia see the use of neuroscience in human resources in their family business".

In the interest of exploring and determining perspectives of young family business managers within the use of neuroscience by leading people, we investigated their perceptions of neuroscience in the field, whether they are already implementing any of the neuroscience methods in their businesses, and where they see the greatest potential for the application of neuroscience in their businesses in the future. Organizational cognitive neuroscience draws together all the fields of business and management, including their operation in the wider social world. It does this to integrate understanding about human behaviour in organizations and, consequently, to more fully understand social behavior **[71]**.

Based on the respondents' answers, we will offer suggestions and recommendations for practice.

Table 1 presents the most important genderless terms expressed by individual managers in their answers. In the "Expression column", we see a summary of the most frequently used expressions in the answers of all our respondents. The "Importance column" shows the results of the TF-IDF method and the individual values represent the weight of the importance of the words used by the managers in the structured interviews. On this basis, we can state that managers mostly associate neuroscience in their businesses with people, employees and a positive future for their business. These allegations show that managers see neuroscience as improving the business's functioning concerning their employees. Importantly, neuroscience is perceived positively in managers' awareness, not as an unnecessary burden. By building solutions informed by the science of how the brain works, author Rock believes organizations can bridge the intention behaviour gap and create lasting behaviour change **[72]**.

**Table 1** Important terms in managers' statements.

| Expression | Importance |
|---|---|
| **people** | 116.02 |
| **staff** | 105.08 |
| **future** | 104.08 |
| **enterprise** | 103.47 |
| **positive** | 93.55 |

Following figure 1 presents the terms that young family business managers used most often in their statements about neuroscience (without taking gender into account). We show only the result of TF-IDF method.

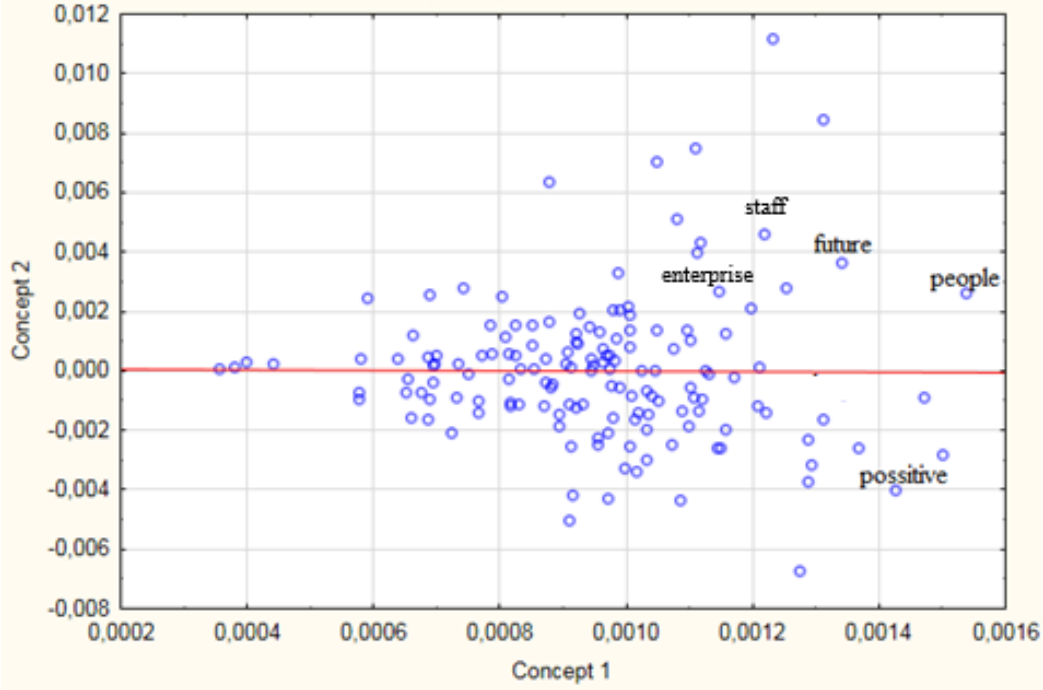


**Figure 1** The most often used terms by young family business managers.

Based on the distribution of individual expressions, we could classify them into 4 groups with various areas in which respondents perceived the application of neuroscience in the company. Group 1 was mostly devoted to the place of work and the leadership of the people. Respondent's answers in Group 2 were focused on people and developing their capabilities that can be used to increase the efficiency of the business. Butler et al also wrote about greater attention to bear on the place of mental processes in explaining human behaviour and effectiveness **[73]**.

We assessed these two duties based on the statements of young women working in managerial positions. Group 3 and Group 4 displays expressions of male managers with focus on education and opportunities to improve the functioning of the business. Neuroscience also studies how education changes the brain, and what the mechanisms are that lead to behavioural change (or the absences thereof) through education **[74]**.

We can see that all the statements are positive, which we rate very positively.

Implementing the neuroscience paradigm for public organizations is expected to enhance inspiration and innovation for the employees, transforming the organization into a best working place for employees that witness a feeling of integration and accomplishment in realising organizational success.

In the next part of our research, we focused on finding out if there are some differences in young family business managers´ views on neuroscience in human resources management by leading people –on the base of gender. From the managers' interview responses and the terms, they used most frequently concerning neuroscience in human resources. We found out that women were focused on the working environment (color, feelings, and perception) and men were focused on working with employees (development and education of employees). Modern organizations could seek actions that stimulate the reward and pleasure centers of the brain while making the person experience feelings of acceptance and recognition. In the same direction, neuroscience is decoding the societal engagement and exploring the human behavior in working places supporting the overall struggle for maximization of performance **[75]**.

Table 2 shows the first 6 terms that each gender assigned the most importance. In the “Expression columns”, there is a summary of the most frequently used expressions in our respondents' answers, females and males separately. The “Importance column” shows the results of the TF-IDF method and the individual values represent the weight of the importance of the words used by the managers in the structured interviews. Women placed the greatest importance on people in the workplace – employees. They focused on working with human resources, improving the working atmosphere and an emotional approach. Workplace happiness is one of an organisation's most valued and pursued goals. Researchers, scholars and practitioners have acknowledged the benefits that a happy workforce brings to the table and its enormous contributions to business outcomes. Learning from neuroscience teaches us that happiness is a state of mind resulting from the complex interplay of hormones and neurotransmitters and that the release of neurochemicals and neurotransmitters has a role to play in making us happy **[76]**.

In contrast, men paid attention to increasing performance through creativity, development and education of employees. According to Abraham, several neuroscientific approaches have been adopted to relate creativity to brain function **[77]**.

The most interesting fact is that no manager has dealt with the use of neuroscience in the selection of employees.

**Table 2** Comparison of terms used by managers concerning neuroscience.

| Females | | Males | |
|---|---|---|---|
| **Expression** | **Importance** | **Expression** | **Importance** |
| **people** | 97.75 | **Creativity** | 22.84 |
| **enterprise** | 93.47 | **People** | 21.94 |
| **staff** | 88.82 | **Development** | 21.69 |
| **resources** | 87.66 | **Use** | 20.90 |
| **improvement** | 83.05 | **Resources** | 20.83 |
| **environment** | 76.09 | **Education** | 18.95 |

**Perception of neuroscience by managers – female:** The involvement of women in a family firm´s board is an important theme to explore **[78]**.

In our research, we found out that women perceive neuroscience in two areas. Both areas are oriented towards the internal employees of the company. They focus on working with human resources and applying neuroscience knowledge to create a better working environment, so that employees have better working conditions. The results of Swedish study show that workplace distress is a major problem for neuroscience, and respondents found it difficult to influence their working conditions **[79]**.

Another study considers how scientifically valid neuroscience could boost the functioning of organizations, improve working conditions for employees, and help individuals achieve goals **[80]**.

As part of the group 1 interpretation, we can conclude that women have placed particular emphasis on the place of work and leadership. Changing and improving the working environment positively affects employees who often spend long hours in the office. This is also stated in Berkman's **[62]** research: "when things are changing around us, it is an opportunity to create new habits that will help us better respond and manage the new environment". This finding is also matched by Teacu's et al. **[26]** research. As part of the interpretation of Group 2, women also focus on people and developing their skills so that the business operates better. People are the key factor that can change or be adapted to the business conditions in a certain way. Placing the right leadership, can foster innovation or competitive advantage. It is also stated in Freedman's **[66]** research about the conscious change of human behavior to one that is more beneficial for the individual and his surroundings. The biggest problem in the current situation was seen in the uniform management style of all employees.

Family businesses are a specific form of business, so family members are often at the top **[81]**. This also affects the way of leading people and the business working environment. Family members may not have always the necessary competence to work with human resources. Since women are more often in management positions in family businesses than in non-family enterprises **[82]**, the management of employees in family businesses is characterized by emotional reflection by leaders **[83]**. According to research, family businesses use a transformative management style **[84]**. Studies show that family businesses have leadership styles that can hamper a business, e.g. sibling leadership teams **[85]**.

**Perception of neuroscience by managers – male:** Young men tend to focus on using neuroscience to grow employees, which the business already has. In the overall approach, they see its application in improving human capital in the company. In the interpretation of the Group 3 results, we see it focused mainly on using neuroscience in employee education and stress management. Managers see the possibility of neuroscience application in their employees´ education, they look for more effective ways to manage the issues. This is also seen by Gocen **[32]**. In his research he points to the use of neuroscience in the education of good leaders. A very positive finding is that managers are also interested in dealing with their employees' stress level. Slovak employees´ stress is higher than in other EU countries **[49]**. Group 4's results focus mainly on the ways of improving the operation of the business. As Zhang **[10]** states, business managers must handle their employees' motivation carefully, so the result is not counterproductive to anyone. Therefore, very positive finding is that they want to use the knowledge of neuroscience to improve the company's functioning. Neuroscientific evidence has the potential to uncover new insights and refine the conceptual ideas of intrinsic motivation by articulating the granular processes of motivation that behavioral methods alone cannot afford **[86]**.

In family businesses, stress affects business and relationships. This all affects the blending of family and work life **[87]**, which is the young men result in our research. Although Sirotková et al. **[88]** claim that there is a more pleasant way of cooperation in family firms, there is a lack of strategic planning. This also affects management stress. Education is important for family businesses from the point of view of introducing innovations into business. This topic is most often associated with succession **[89]**. However, whether of successors or ordinary employees, training plays an important role in the company's development, and neuroscience offers new perspectives on training that these companies can use.

Successor attributes related to emotional intelligence, such as establishing trust by demonstrating integrity, a genuine commitment to the business, and commanding respect from employees, are highly desired in family organizations **[90]**. Next-generation leaders, who have ambitions of entering the family business, should build deep, profound, and symbiotic relationships that grant them the essential background and the necessary tools to develop into effective leaders **[91]**.

The historical aspect of SME in Slovakia influences the fact that it is difficult to perform neuroscience in Slovak conditions. However, times are changing. Modern technologies have evolved, and it is now possible to explore or display facts more easily and at the same time more minutely and accurately than a few years ago, when the talks about it only started in our conditions **[59]**. Studies on neuroscience research in human resources are steadily increasing **[92]**.

The Scientific hypothesis was formulated: Young managers of family food businesses perceive neuroscience in HRM positively and are also ready to implement it in business practice. The topics that young managers of family food businesses deal with in the field of neuroscience in HRM are different from the topics that female managers deal with.

Based on the questionnaire survey results, we tested the dependency between statements. In the table there are the detected values as test results for both cases are in the following Table.

**Table 3** Dependency testing.

| Statistic | Value | Prob | Statistic | Value | Prob |
|---|---|---|---|---|---|
| **Chi-Square** | 269.1030 | <.0001 | **Chi-Square** | 324.2142 | <.0001 |
| **Likelihood Ratio Chi-Square** | 241.1845 | <.0001 | **Likelihood Ratio Chi-Square** | 193.2273 | <.0001 |
| **Mantel-Haenszel Chi-Square** | 191.1121 | <.0001 | **Mantel-Haenszel Chi-Square** | 225.1054 | <.0001 |
| **Phi Coefficient** | 0.4881 | | **Phi Coefficient** | 0.5142 | |
| **Contingency Coefficient** | 0.5115 | | **Contingency Coefficient** | 0.5371 | |
| **Cramer's V** | 0.3412 | | **Cramer's V** | 0.3847 | |

Analysis of dependence was performed by $\chi 2$ test. Based on a Prob value lower than alpha (0.05), we confirmed that the dependence between statements exists in both cases. Its tightness was verified by Cramer's V – coefficient. Values 0.3412 and 0.3847 in the previous table indicate moderate dependence.

As we found out, young leaders of family food businesses do not see neuroscience as a burden, but rather as a way of doing things more efficiently and better. They see the opportunity for its application mainly in creating an acceptable and more suitable working environment. It is essential in their employees´ development. Employees can receive new information (education) better through the use of neuroscience knowledge and make it easier to accept changes. Managers can communicate better with employees thanks to knowledge and neuroscience methods, which is the first step to company success. Dürrbeck found that human resource executives are well aware of neuroscience with business applicability, while leaders' awareness was identified as rather low. However, relevance for corporate success and application within leadership development programmes were shown to be low or non-existent. Here neuroscience principles were shown to bear valuable potential to tackle future challenges of leaders and organizations. Therefore, the prospects for increasing the application of neuroscience content within leadership development are promising **[93]**.

## CONCLUSION

Based on neuroscience knowledge, if an individual feels well and his brain evaluates the current situation as "safe", the so-called approach emotions (trust, enthusiasm, joy, love) begin to form. These emotions are a prerequisite for successful project implementation, enabling cooperation, rational decision-making and creative problem-solving. Managers should therefore strive for a friendly atmosphere in the workplace and a pleasant working environment for employees. Young managers have a relatively easy way to become good managers and good leaders. By applying neuromanagement, they can gain better relationships at the workplace but also with business partners. Managers should also focus on the training they provide to their employees. It is more effective from the neuroscience point of view to use active learning forms more effectively than traditional forms of education.

One of the first and simple step to apply neuroscience knowledge to business practice is to divide tasks for employees into smaller projects. We know that the brain is satisfied after completing the task and tries to achieve this feeling repeatedly – therefore it will try to complete other partial goals-tasks. In the end there will be a comprehensive fulfilment of the task. The next step may be a gradual transition to experiential learning. Research shows that by applying the knowledge of neuroscience to the learning process that is brought about by experiential learning, employees acquire new knowledge much faster. Managers should also strive to apply a positive attitude. By using the mindfulness method, they can create a better work environment and employees are more productive in such an environment. A stress-free work environment will have a better impact on employees, who can make better use of their potential. Young generation of family business´ leaders has a positive attitude towards neuroscience. They are already trying to apply it in human resource management or inclined to this management direction. We consider this a very important conclusion, as the fact that they are not afraid of neuroscientific methods and do not shy away from them creates favorable conditions for implementing these methods in practice.

There are still opportunities and space for improvement. Our findings can be used in the future for comparative analysis of how neuroscience perception and its implementation in SMEs in Slovakia have progressed. The aim will be to compare managers' opinions from the research currently being carried out with those within the range of 5 years. Based on our research, it can be assumed that there is room for increasing managers' awareness of the possibilities of using neuroscience in human resources management. Managers should be more exposed to the possibilities of using neuroscience knowledge in practice. A very good and suitable alternative to this is free-of-price workshops, where the basic advantages of these methods are presented to them. Neuroscience will also come to managers' attention by working more closely with universities on research focused on innovative methods and neuroscience in human resources management. This research was deficient because it was carried out during strict anti-pandemic measures due to covid-19, and many businesses preferred work from home. For this reason, some of the answers could only take the form of an ideal idea of a manager.

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## Ethical Statement:

This article does not contain any studies that would require an ethical statement. Ethical review and approval was waived for this study BECAUSE anonymous surveying was conducted. Each of the respondents personally agreed in advance to conduct the survey. Consent was waived due to maintaining the anonymity of respondents.

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