COGNITIVE DISTORTIONS IN MANAGERIAL WORK – DIFFERENCES BETWEEN MALE AND FEMALE MANAGERS

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Abstract: Work-related gender issues are linked to the issue of gender equality in the labor market, remuneration, work motivation, satisfaction, performance, compatibility of work and family life, and career development, including creation of equal opportunities for individual development of the personal potential of every individual. This area may also include the gender specifics of performing managerial work, particularly in the context of the presented paper in which attention was focused on gender differences in the occurrence of cognitive distortions in managerial work. Methodology PCD18 enabling specification of four attributes of occurrence of cognitive distortions in thinking and decision-making of managers (negative prophecies, thought-reading, unsubstantiated conclusions, argumentation through emotions) was used. A mathematical and statistical analysis of the acquired data confirmed the existence of statistically significant differences in the responses of male and female managers in evaluation of the selected attributes of occurrence of cognitive distortions. In this sense, there is a clear tendency towards a greater impact of emotions on the occurrence of cognitive distortions among women.

Key words: cognitive distortions, PCD18 methodology, gender, male and female managers

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Introduction

The issue of gender, gender equality, and gender differences is widely discussed in various scientific disciplines and a significant place is taken by the gender issues also in the areas of politics, culture, family, human work, not excluding management. Thinking of managers when trying to solve problems does not always correspond with the criteria of objective rationality. Contrarily, the thinking processes of managers may deviate from the norms of rationality to varying degrees (Samuels et al., 2004). They may be affected by emotions, cognitive schemas, subjective beliefs, attitudes and other attributes which participate in creation of the subjective image of reality and significance of the phenomena attributed to the reality. Limits of cognitive abilities, which manifest themselves mainly in solving problems, are, according to Newel and Simon (1972), the source of occurrence of cognitive distortions in thinking and decision-making. These distortions within the cognitive space are represented by simplified, generalized mental representations
and schemas. Cognitive schemas may lead to distortion of information and, ultimately, to cognitive distortions, however, they are an important instrument of perception, understanding, learning, reasoning and decision-making. They also facilitate and simplify decision-taking, primarily in time pressure situations which are very typical in managerial decision-making. It is important to be aware of the effect of these, often subconscious, simplification schemas and their potential impact on cognition and decision-making in the form of cognitive distortions. The multifactor concept of cognitive distortions includes both the subjective and the objective attributes. Aim of the presented research is, as part of the aforementioned concept, to identify and specify gender differences in assessment of the occurrence of cognitive distortions in managerial work.

Cognitive Distortions

Conceptualization of the construct of cognitive distortions is based on an assumption that the mental picture of the external reality is recognized on the basis of an interaction between the external stimuli and pre-existing mental structures, which were examined from different perspectives as schemas, personal constructs, irrational beliefs, contrafact thinking, risk, burnout syndrome, Dunning-Kruger effect and others (Beck et al., 1979, 2007; Kelly, 1955; Ellis, 1962; David et al., 2010; Allais, 1953; Mandel et al., 2005; Istenik, 2011, and others). Beck (1967) also characterized cognitive schemas as mental images used for interpretation of oneself and the outside world. They are relatively stable ways of organizing thinking and evaluating events. Schemas represent the set of fundamental, often untold, subconscious beliefs about who I am, what is the world around me, and what I can expect from it. On the one hand, they facilitate and simplify the process of thinking and creating of mental images but on the other hand, they may also cause generation of wrong conclusions followed by wrong decisions. An essential factor in this regard is the fact that people are not aware of their cognitive distortions (Brugger, 1994). It is important to distinguish the cognitive distortions on the unintentional basis from a dishonest argumentation that is carried out deliberately (Ruisel, 2012). For these reasons, it is important to detect cognitive distortions and specify their predictors (Frankovský et al., 2015, 2016). Emotions are another important factor that affects the occurrence of cognitive distortions. They affect all cognitive processes, perception, memory, attentiveness and decision-making (Adolphs et al., 2001). Their links to the cognitive distortions may be included in the neuropsychological approach to analyzing the relationship between emotions and cognitive functions (Höschl, 2002). The relationship of emotions and cognitive processes is reciprocal (Forgas, 2001). The cognitive process may either develop or suppress emotional reactions. At the same emotions can have a significant impact on the cognitive process and this impact may be both positive and negative. Negative emotions guide the body to be more concerned about its environment, they produce a more externally oriented
way of thinking which perceives the demands of the outside world and gives them precedence over internal thoughts (Bless, 2000). On the other hand, positive emotions lead to the release and relaxation of the organism (Zibrínová et al., 2014). One of the important concepts of examination of cognitive distortions is focusing attention to the taxonomy and typology of cognitive distortions. Typical cognitive distortions are, according to Beck (Beck et al., 1979) unsubstantiated conclusions (arbitrary deductions), distorted selection of facts (selective abstractions), over-generalization, exaggeration and downplaying, touchiness (personalization), black-and-white thinking (dichotomous thinking), thought-reading, Negative prophecies, disqualification of the positive, argumentation through emotions (catathymic thinking), marking.

**Gender and Management**

The discussions on the concepts of gender and sex have been, from the moment of discovery of the term gender (Oakley, 1972), carried out to the effect that gender is seen as a social and cultural construct, as opposed to sex as a biological feature. Oakley (2000) defines gender as a social construct that reflects the fact that the characteristics and behavior associated with the image of women and men are shaped by culture and society.

Management is an area traditionally consisting of a greater number of men. Wajcman (1998) argues that management is generally based on masculinity, which automatically pushes women out of the picture. The process of socialization attributes the right to make decisions and run an organization mainly to men (Wilson, 2001). Rutherford (2011), however, describes the knowledge acquired by her research through interviews with women in managerial positions. According to the author, women believe that they can listen better, have greater empathy and are easier to establish and maintain relationships in the workplace.

Unlike men, women underestimate themselves more frequently and are unable to see their own strength and influence (Kaufmann, 2008). Wilson (2001) opposes that the low representation of women in top business positions is not only due to a lack of self-confidence, but stems from the conflict of the two roles: a woman-mother and a woman-employee. Dončevová (2013) adds that if a woman expresses career aspirations that point to managerial positions in the organization structure, she receives criticism.

Bownová and Bradyová (1995) reported that confidence allows women to be more proactive, take more risk and initiative. Self-confidence is often regarded as the most important trait of the female managers. Confidence is a quality that women desire the most because people tend to believe that confident individuals can handle any situation. Conversely, lack of confidence in employment has serious consequences for women in the process of their career advancement.

In the context of the abovementioned characteristics of male and female managers it is possible to interpret the differences in occurrence of cognitive distortions
between the male and female managers on the basis of the essential gender characteristics (Ward, 2000):

- *Femininity*: emotional, warm, gentle, altruistic, sensitive, kind, family-oriented, tender, indulgent, compassionate, honest, modest, helpful, obedient, perceptive, affable, pleasant, trustworthy, ardent, having aesthetic feeling.
- *Masculinity*: dominant, active, strong, powerful, competitive, adventurous, bold, confident, independent, pushy, leadership-oriented, dynamic, risking, assertive, smart, ambitious, stress-resistant, self-disciplined.

Obviously, it is inadequate to consider the occurrence of cognitive distortions in thinking and decision-making of male and female managers only at a general level. Quite contrarily, it can be expected that the differences between the female managers and the male managers will be manifested differently in terms of the individual attributes of prediction of cognitive distortions.

**Method**

The research sample consisted of 92 male and female managers, out of which 37 were men (40%) and 55 were women (60%). Of this number of respondents, 12% were top managers, 28% were middle managers, and 60% were line managers. The average age of all respondents was 28.3 years (standard deviation was 8.366 years). Their minimum age was 19 years, the maximum age was 53 years. Data from respondents were obtained by means of a questionnaire and then processed and analyzed by the statistical software SPSS 20. Through the questionnaire, data on basic socio-demographic characteristics of respondents and on assessment of the occurrence of cognitive distortions were collected. Assessing the occurrence of cognitive distortions was carried out by means of a new original methodology PCD18 (Prediction of Cognitive Distortions – 18 items). Data analyzed in the presented research were obtained from the Slovak managers within various economic sectors during the period of May 1, 2016 to July 31, 2016 by means of the Snowball method.

**Results**

In the presentation of results, attention is initially focused on the results of the development and validation of the methodology PCD18. The factor structure of this methodology is characterized and so are the differences in the assessment of the individual extracted attributes of occurrence of cognitive distortions as well as the basic psychometric parameters of PCD18. The data obtained by this methodology were then used to analyze the differences between the female managers and the male managers in assessing the individual attributes the occurrence of cognitive distortions.
PCD18 Methodology

The PCD18 methodology contains 18 self-evaluation items to which the respondents react by means of the 6-point scale representing the level of agreement (0 = definitely no, 1 = no, 2 = rather no than yes, 3 = rather yes than no, 4 = yes, 5 = definitely yes). PCD18 was designed on the basis of Beck’s (1967, Beck et al., 1979, 2007) theory of cognitive schemas and cognitive distortions, using the experience gained by utilizing the PCD methodology (Prediction of Cognitive Distortions), which contains 16 items (Frankovský et al., 2015). This methodology enables prediction of cognitive distortions based on two predictors: Distorted selection of facts (Cronbach’s alpha – .728) and Over-generalization (Cronbach’s alpha – .703). Basic information about this methodology was published by Frankovský et al. (2015, 2016). PCD18 (Frankovský and Birknerová, 2016) was designed and verified to create a more particular and more specific characterization of the attributes of occurrence of cognitive distortions. The items of the methodology are presented at the end of this report.

The factor analysis of the items of PCD18 was carried out on the basis of data acquired from 685 respondents. Of this number, 185 respondents (27%) were men and 500 (73%) were women. The sample consisted of 1.6% of top managers, 3.8% of middle managers, 8% of line managers, 18.4% efficient workers and 54.5% of management students. The average age of respondents was 23.3 years (standard deviation was 5.088 years). Their minimum age was 18 years, the maximum age was 53 years.

Based on the test results of Kaiser-Meyer-Olkin Measure of Sampling Adequacy – 0.766 and Bartlett’s Test of Sphericity – 1956.715 (significance – .000) were by a factor analysis (Principal Component Analysis with Varimax rotation) extracted four factors labeled as:

- **Negative prophecies**: Managers who score higher in this factor tend to expect the worst; they see the negative consequences, await disasters without real reasons, and do not think positively. Cronbach’s alpha – .872.
- **Thought-reading**: Managers who score higher in this factor believe that they know what other people think; based on that they can arrive at conclusions, try to read the thoughts of others, rely more on penetration into the minds of others than to what they say or do. Cronbach’s alpha – .756.
- **Unsubstantiated conclusions**: Managers who score higher in this factor can also decide on the basis of a single piece of information or fact; they do not need much information to make a decision and evaluate the phenomena based on a single event. Cronbach’s alpha – .723.
- **Argumentation through emotions**: Managers who score higher in this factor consider emotions as part of the decision-making, which they deem crucial to make the decision; sometimes they make decisions based exclusively on emotions. Cronbach’s alpha – .689.
The extracted factors explain 47.01% of variance (Table 1). The values of the Cronbach’s alpha coefficient indicate that the internal consistency of items saturating the specified factors is in the range of acceptability. The proposed structure of the defined factors of the PCD18 methodology is supported by the value of the calculated inter-correlation coefficients between the individual factors (Table 2). The extracted PCD18 factors correlate with each other. These correlations, although statistically significant, take low values. This means that these factors are not identified by the same attributes of occurrence of cognitive distortions. On the contrary, it suggests that they describe different though related areas of occurrence of cognitive distortions.

### Table 1. Eigenvalue and percentage of explained variance for the extracted factors

<table>
<thead>
<tr>
<th>Items</th>
<th>Factors</th>
<th>Negative prophecies</th>
<th>Thought-reading</th>
<th>Unsubstantiated conclusions</th>
<th>Argumentation through emotions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eigenvalue</td>
<td>2.732</td>
<td>2.138</td>
<td>1.976</td>
<td>1.614</td>
</tr>
<tr>
<td></td>
<td>% total variance</td>
<td>15.18</td>
<td>11.88</td>
<td>10.98</td>
<td>8.97</td>
</tr>
</tbody>
</table>

The comparison of assessments of the individual factors by managers using the Friedman’s test highlights the existence of statistically significant differences in the responses of managers in the assessment of these attributes (Frankovský and Birknerová, 2016). The results of this analysis indicate that the highest level of agreement was found in the assessment of Argumentation through emotions. Contrarily, the lowest level of agreement was detected in the assessment of Negative prophecies (Table 3).

### Table 2. Inter-correlation coefficient values between the factors of PCD18

<table>
<thead>
<tr>
<th></th>
<th>Thought-reading</th>
<th>Unsubstantiated conclusions</th>
<th>Argumentation through emotions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative prophecies</td>
<td>.089</td>
<td>.253**</td>
<td>.080</td>
</tr>
<tr>
<td>Thought-reading</td>
<td>.140**</td>
<td></td>
<td>.123**</td>
</tr>
<tr>
<td>Unsubstantiated conclusions</td>
<td></td>
<td></td>
<td>.105**</td>
</tr>
</tbody>
</table>

Legend: * statistical significance at the .05 significance level ** statistical significance at the .01 significance level

### Table 3. Assessment of the factors of occurrence of cognitive distortions (average values)

<table>
<thead>
<tr>
<th></th>
<th>Negative prophecies</th>
<th>Thought-reading</th>
<th>Unsubstantiated conclusions</th>
<th>Argumentation through emotions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average value</td>
<td>1.55</td>
<td>2.48</td>
<td>1.49</td>
<td>2.94</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>.979</td>
<td>.689</td>
<td>.622</td>
<td>.707</td>
</tr>
</tbody>
</table>
Mathematical and statistical analyses of the data (using t-test for independent samples) confirmed the statistically significant differences in the responses of the male and female managers in assessing the occurrence of cognitive distortions attributes of Unsubstantiated conclusions and Argumentation through emotions. When assessing both these attributes, the female managers achieved higher scores than the male managers. This means that the occurrence of cognitive distortions of female managers is influenced by unsubstantiated conclusions and argumentation through emotions in an extent greater than of the male managers. In terms of occurrence of cognitive distortions, a greater tendency to make decisions based on one piece of information was revealed among the female managers as opposed to the male managers, who do not tend to evaluate phenomena based on a single event. At the same time, female managers regard emotions as part of the decision-making, they deem them crucial to the decision, and sometimes they decide only according to their emotions.

### Table 4. Differences in assessment of the individual attributes of occurrence of cognitive distortions between male and female managers

<table>
<thead>
<tr>
<th>Gender</th>
<th>Mean</th>
<th>T - test</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative prophecies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.4071</td>
<td>.080</td>
<td>.937</td>
</tr>
<tr>
<td>Female</td>
<td>1.4231</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thought-reading</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2.6432</td>
<td>.384</td>
<td>.702</td>
</tr>
<tr>
<td>Female</td>
<td>2.5852</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unsubstantiated conclusions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.1946</td>
<td>3.433</td>
<td>.001</td>
</tr>
<tr>
<td>Female</td>
<td>1.6302</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argumentation through emotions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2.5764</td>
<td>2.489</td>
<td>.015</td>
</tr>
<tr>
<td>Female</td>
<td>3.0100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When interpreting the findings presented above it is crucial to accentuate the fact that the identified differences, albeit statistically significant, represent only the differences in the degree of disagreement with the given attributes of occurrence of cognitive distortions between the male and female managers.

### Discussion and Conclusion

Cognitive distortions have been, are and will be part of every person’s life. They influence the thinking and decision-making on a continuum from normality to mental disorders. The work of managers is associated with rational thinking, evaluation of facts and avoidance of errors; therefore, the occurrence of cognitive distortions in the manager's work is considered to be a negative phenomenon and a potential risk of taking bad decisions.

Tendencies towards cognitive distortions are often linked with the process of strategic decision-making by managers. The occurrence of cognitive distortions in terms of decision-making is related to the limited number of objectives and a limited number of alternative solutions. From the position of managers, the risk...
factors are insensitivity to the likelihood of the outcome and the illusion of handling, all of which are related to the heuristic tendencies. Managers who make mistakes in decision-making, are known to rely on a number of critical incorrect rules or heuristics to facilitate complex decision-making situations, rather than to analyze the situation in depth. The negative consequences of adoption and use of subjective heuristics lead to cognitive distortions, which cause that managers fail to make an optimal, suitable decision. This creates a situation where the decision-making of managers becomes vague, uncertain and lacking the precise structure (Das and Teng, 1999).

The presented PCD18 methodology represents one of the possibilities of prediction of cognitive distortions in thinking and decision-making of managers. Its design is based on Beck’s (Beck et al., 1979) concept of categorization of cognitive distortions. It reduces the original number of 11 categories to 4 predictors identifying the possible occurrence of cognitive distortions in managerial work. Development of the PCD18 methodology follows the experience with the PCD16 methodology by means of which it is possible to specify two highly generalized attributes of occurrence of cognitive distortions in managerial work – Distorted selection of facts and Over-generalization (Frankovský et al., 2015, 2016).

The PCD18 methodology identifies predictors of cognitive distortions at a more specific level than the PCD16 methodology. Unlike PCD16, it allows characterization of the relationship between emotions and occurrence of cognitive distortions. As already mentioned, the aspect of emotions is one of the typical attributes of the occurrence of cognitive distortions, within which there are significant differences between male and female managers. In this sense, there is a clear tendency towards a greater impact of emotions on the occurrence of cognitive distortions among women.

From a methodological point of view, thus presented findings contribute to a meaningful debate at the level of generalization of detection of behavior predictors but also in the context of managerial work. As it was mentioned before, the PCD16 methodology represents a high degree of generalization of the detected predictors. PCD18 in this context represents a lower rate of generalization of the studied predictors.

One of the important factors of the practical implementation of the results of examination of the occurrence of cognitive distortions in managerial work is the fact that the managers are not aware of the aforementioned distortions, as well as the attributes associated with them (Ruisel, 2012). The presented theoretical and methodological concept of occurrence of cognitive distortions in managerial work enables focusing attention in selection of people for managerial positions to the specific aspects directly related to the possible occurrence of these distortions. Another area of practical implementation of that concept is the training of managers specifically aimed at their awareness of the existence of the attributes associated with the occurrence of cognitive distortions, which managers are not aware of.
Ultimately, it is also possible to develop decision-making systems within organizations, which reduces the likelihood of cognitive distortions in managerial decision-making (Štefko and Gallo, 2015; Štefko et al., 2015; Suhányi and Suhányiová, 2014).

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ZABURZENIA POZNAWCZE W PRACY MENEDŻERA – RÓŻNICE POMIĘDZY MĘŻCZYZNAMI A KOBIEΤAMI MENEDŻERAMI

Streszczenie: Kwestie płci związane z pracą odnoszą się do zagadnienia równości płci na rynku pracy, wynagrodzenia, motywacji do pracy, satysfakcji, wydajności, kompatybilności pracy i życia rodzinnego oraz rozwoju zawodowego, w tym stworzenia równych szans rozwoju indywidualnego potencjału osobistego każdego człowieka. Obszar ten może również obejmować specyfikę płci dotyczącą wykonywania pracy menedżerskiej, w szczególności w kontekście niewielkiego artykułu, w którym skupiono się na różnicach między płciami w występowaniu zaburzeń funkcji poznawczych w pracy menedżerskiej.
W tym celu użyta została metodologia PCD18, umożliwiająca określenie czterech cech występowania zaburzeń poznawczych w myśleniu i podejmowaniu decyzji menedżerów (negatywne przepowiednie, odczytywanie myśli, nieuzasadnione wnioski, argumentacja poprzez emocje). Matematyczna i statystyczna analiza uzyskanych danych potwierdziła istnienie statystycznie istotnych różnic w odpowiedziach menedżerów płci męskiej i żeńskiej w ocenie wybranych cech występowania zaburzeń poznawczych. W tym sensie istnieje wyraźna tendencja w kierunku większego wpływu emocji na występowanie zaburzeń poznawczych wśród kobiet.

Słowa kluczowe: zaburzenia poznawcze, metodologia PCD18, płeć, mężczyźni i kobiety menedżerowie

管理工作中的認知錯誤 – 男性和女性經理之間的差異

摘要：與工作有關的性別問題與勞動力市場的性別平等問題，薪酬，工作動機，滿意度，績效，工作和家庭生活的兼容性以及職業發展等問題有關，包括為個人發展提供平等機會每個人的個人潛力。這一領域還可能包括執行管理工作的性別細節，特別是在提出的論文中，注意力集中在管理工作認知失真發生中的性別差異。方法論PCD18使得能夠規範認知失真發生在管理者思維和決策中的四個屬性（消極預言，思想閱讀，無根據的結論，情緒論證）。對獲得性數據的數學和統計分析證實，男性和女性經理在評估所選擇的認知失真發生屬性時的反應存在統計學顯著性差異。在這個意義上，情緒對婦女認知扭曲發生的影響更為明顯。

關鍵詞：認知扭曲，PCD18方法，性別，男女管理者。