

# EMPLOYEE ASSESSMENT USING THE MODEL OF HIERARCHICAL COMPLEXITY (MHC): CASE STUDY

# Disposition of Master's Thesis

- Employee Assessment Using the Model of Hierarchical Complexity (MHC): Case Study
- Mentor: Dr. Roberto Biloslavo
- Co-mentor: Dr. Michael Lamport Commons
- Company example: GKN Driveline Slovenija
- Country: Slovenia

# Hypotheses

- *H1*: The individual's classification under the MHC and the job hierarchy in the organizational structure are correlated.
- *H2*: The individual's classification under the MHC and his/her job performance are correlated.
- *H3*: Middle managers predominantly function on the systematic level of hierarchical complexity.
- *H4*: Executive managers predominantly function on the metasystematic stage of hierarchical complexity.

# Research Procedure

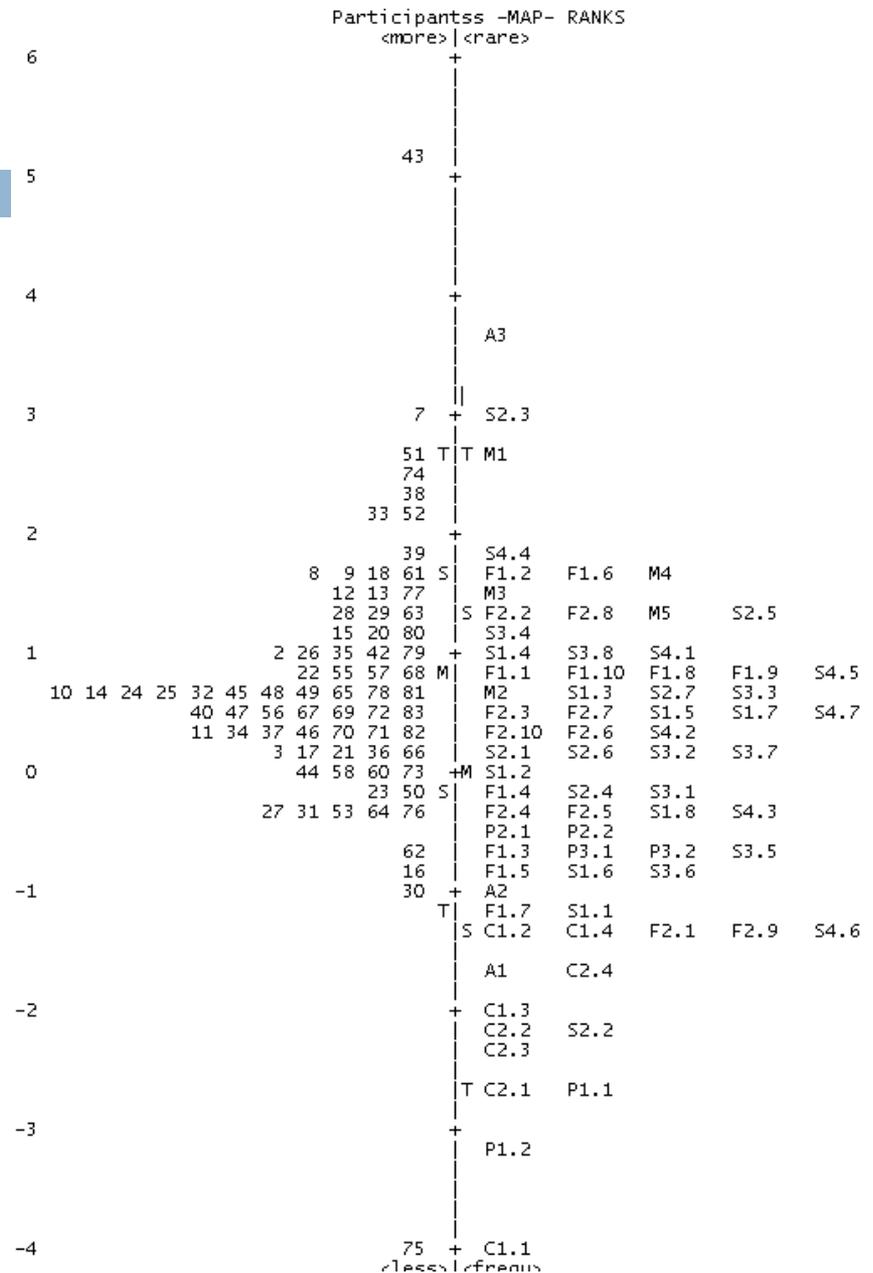
- The research instrument used was a questionnaire including:
  - Demographic questions
    - Age
    - Gender
    - Formal education
    - Work experience
    - Job division and major tasks
    - Topical stories enabling evaluation
  - Perspective Taking Instrument (PTI)
  - Decision Making Instrument (DMI)
- Time to complete 45 minutes.
- Questionnaire was designed in cooperation with the Dare Institute Access to the survey questionnaire by e-mail
- The research participant were anonymous

# Results

- Participants were split into three groups
  - ▣ Executive Managers
  - ▣ Middle Managers
  - ▣ Employees
- Item Rasch analysis of
  - ▣ Decision Making performance
  - ▣ Vignette performance
- Regressions analysis of Item Order of Complexity on Rasch scaled performance score
- DMI and PTI group stage results

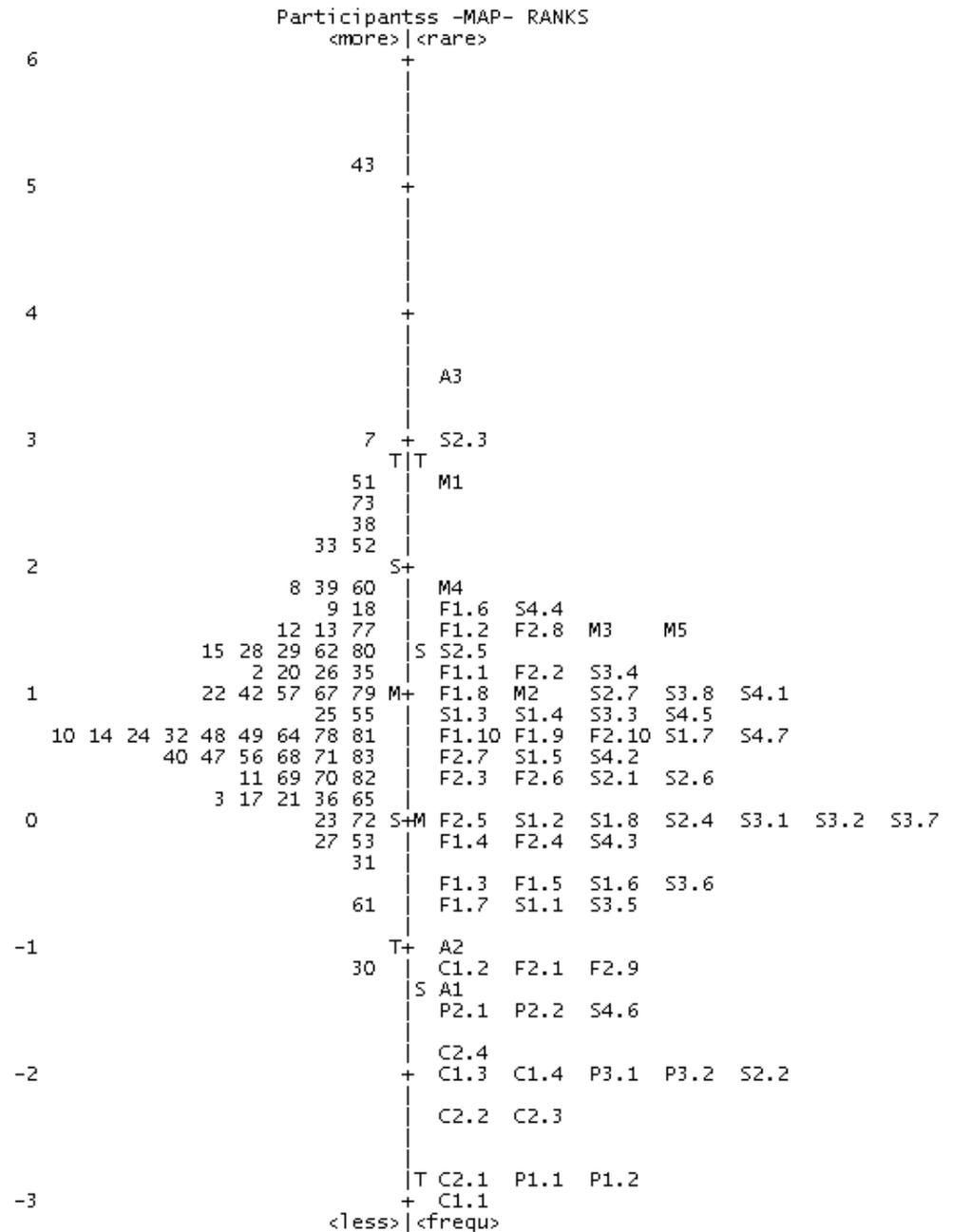
# Rasch Variable Map of DMI Item Performance

- Unaltered Data
- 75 Participants
- 15 (20%) Executive Managers
- 16(21.3%) Middle managers
- 44 (58.7%) Employees
- Regression Results
  - ▣  $r = .587$
  - ▣  $r^2 = .344$



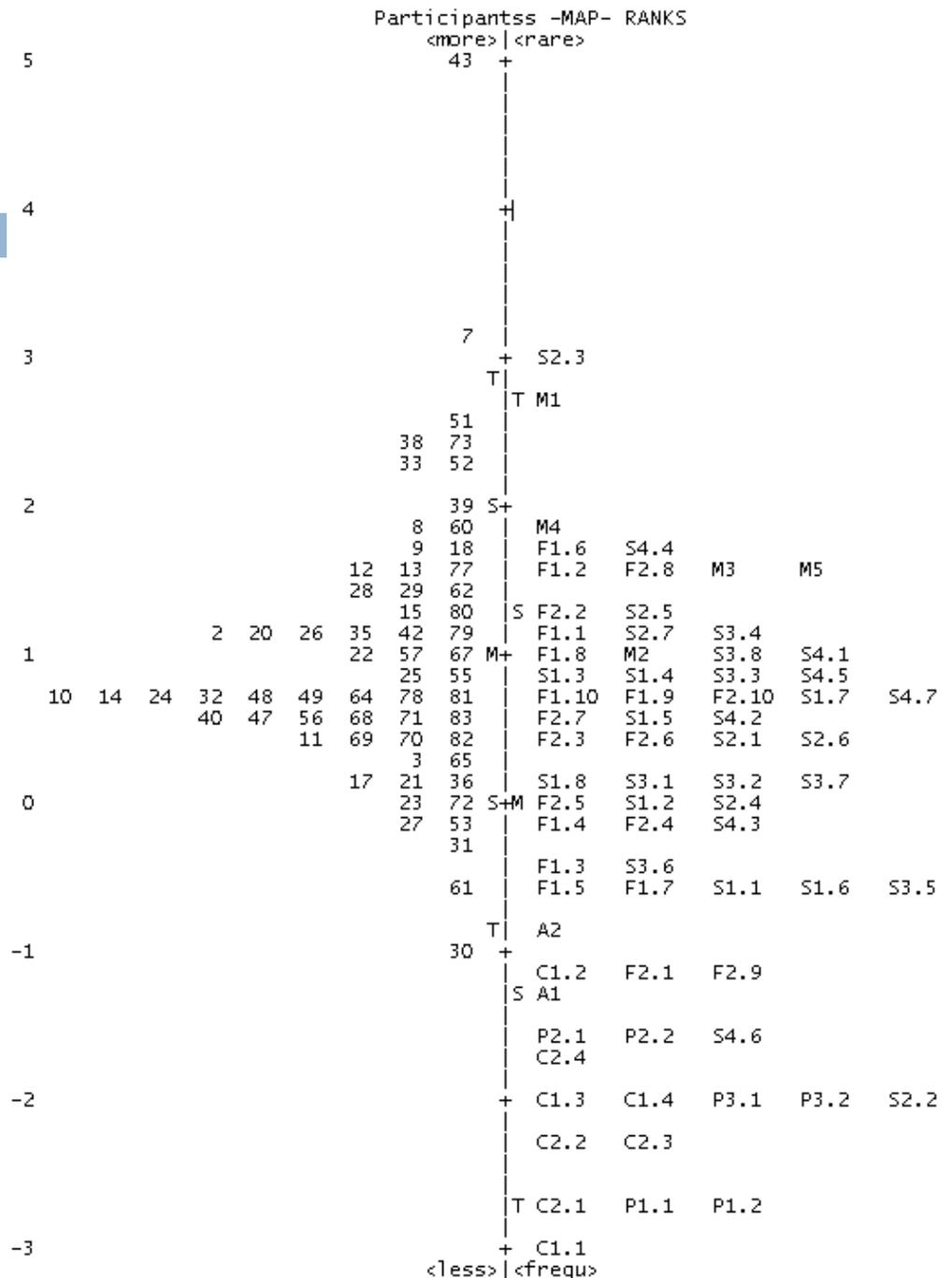
# Rasch Variable Map of DMI Item Performance

- Participants Removed
- 62 Participants
- 13 (21%) Executive Managers
- 10(16.1%) Middle Managers
- 39 (62.9%) Employees
- Regression Results
  - $r = .690$
  - $r^2 = .476$



# Rasch Variable Map of DMI Item Performance

- Participants Removed
- Abstract3 Removed
- 62 Participants
- 13 (21%) Executive Managers
- 10(16.1%) Middle Managers
- 39 (62.9%) Employees
- Regression Results
  - $r = .751$
  - $r^2 = .563$

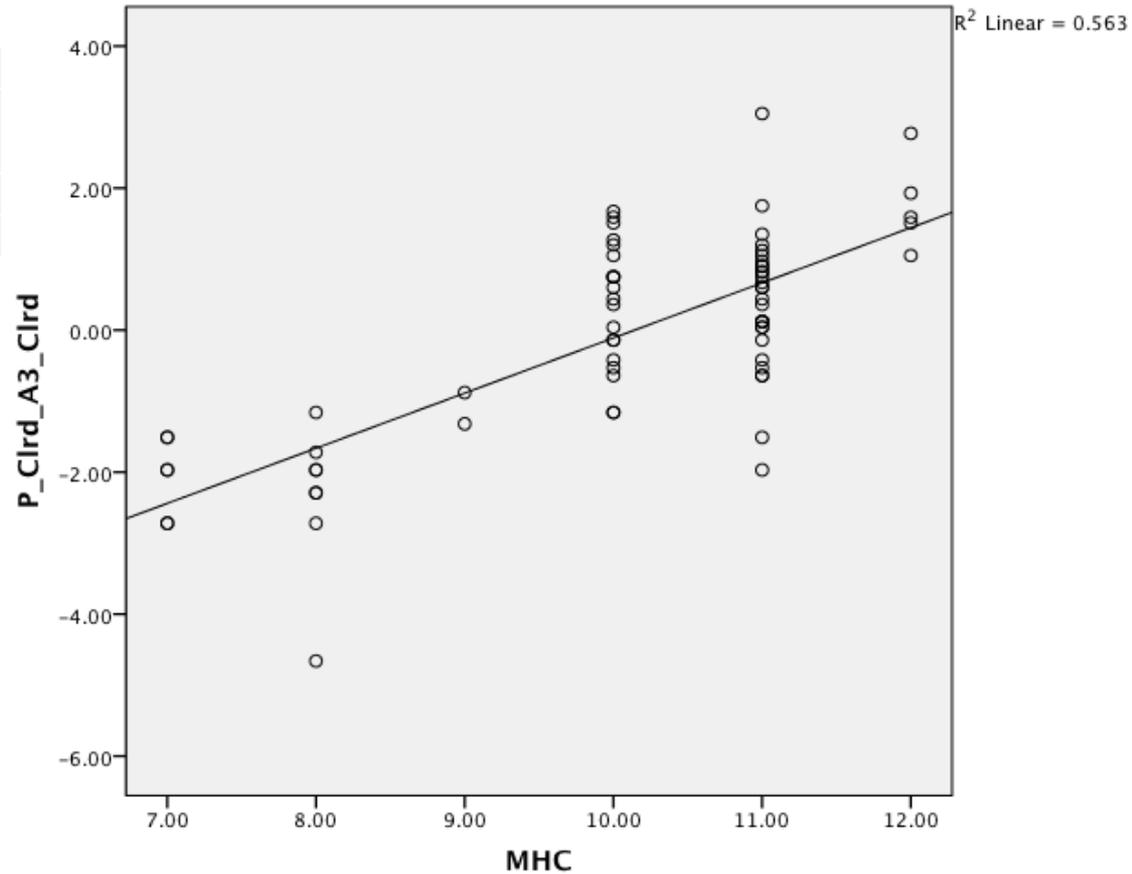


# Scatter Plot of Regression Analysis: Item Rasch Score on Item Order of Hierarchical Complexity

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.751 <sup>a</sup>	.563	.557	.96620

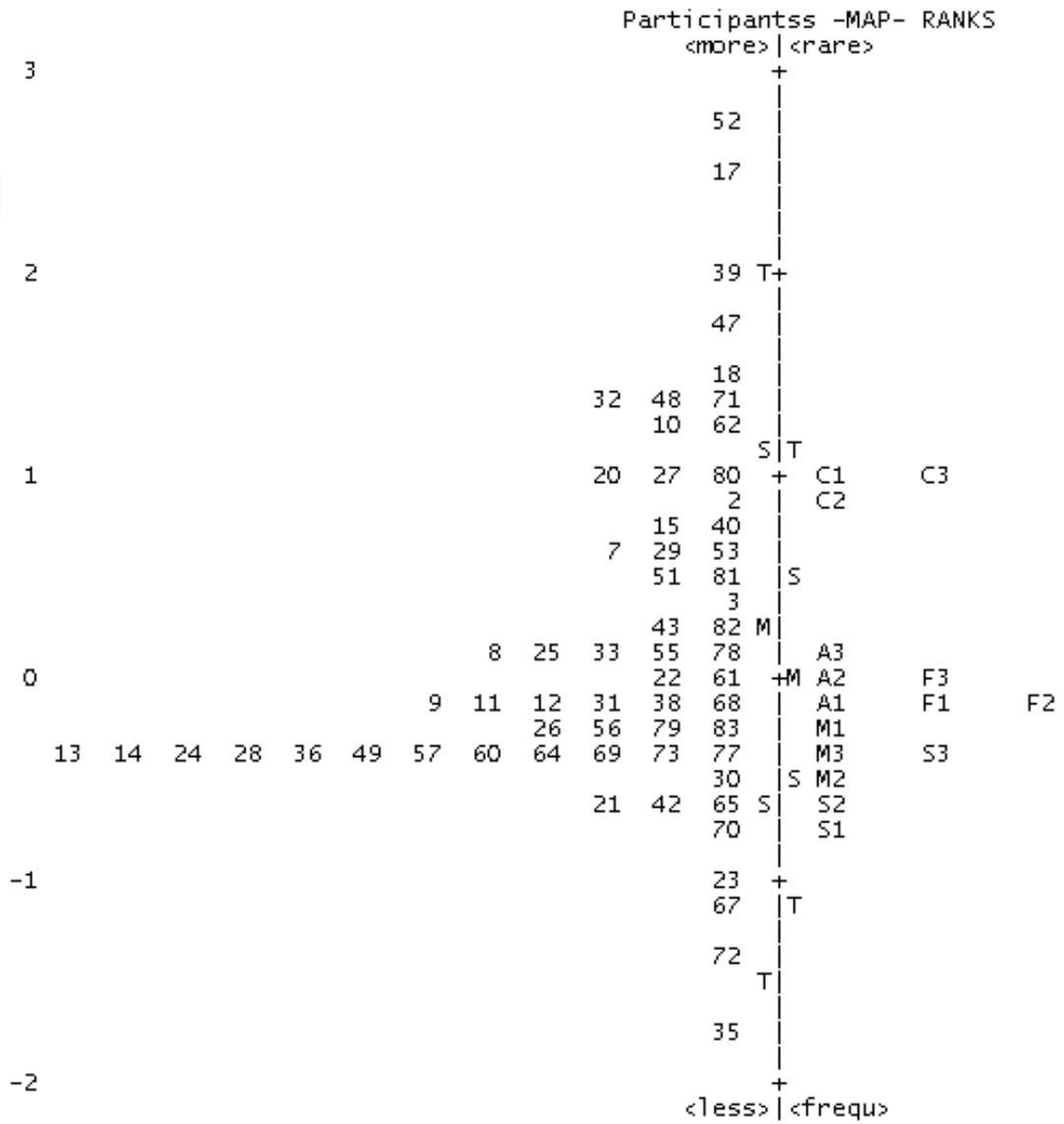
a. Predictors: (Constant), MHC





# Rasch Variable Map of Vignette Item Performance

- Participants Removed
- 62 Participants
- 13 (21%) Executive Managers
- 10(16.1%) Middle Managers
- 39 (62.9%) Employees
- Regression Results
  - ▣  $r = .861$
  - ▣  $r^2 = .742$



# Discussion /1

- 13 participants did not follow instructions.
  - The reason for not following the instructions might be due to the chosen subject matter used a management scenario.
  - Management scenario used in the questionnaire was about manager leading the business project and how it turned out.
  - With management scenario, some participants had personal experience in leading the projects in real business situation.
  - This could cause to answer questions based on their experience instead of using questionnaire tables.

# DMI Group Stage Score Means

- Executive Managers group
  - ▣ Low Systematic stage
  - ▣ 11.13 ( $M = 11.13$ ,  $SD = .467$ )
- Middle Managers group
  - ▣ Upper-Middle Formal stage
  - ▣ 10.73 ( $M = 10.73$ ,  $SD = .564$ )
- Employees group
  - ▣ Upper- Middle Formal stage
  - ▣ 10.69 ( $M = 10.69$ ,  $SD = .479$ )

**Table : Rasch analysis, DMI person score report**

Hierarchy	Mean	N	Std. Deviation
Executive Management	11.1273	11	.46710
Middle Management	10.7333	15	.56400
Employee	10.6889	36	.47915
Total	10.7774	62	.51738

# DMI Person Stage Score Frequencies – without splitting in 3 groups

- Participants on average performed at the
  - ▣ Upper Middle Formal stage
  - ▣ 10.77 ( $M = 10.77$ ,  $SD = .467$ )
- Lowest stage score
  - ▣ 9.60 (Upper Middle Abstract stage)
- Highest stage score
  - ▣ 12.00 (Metasystematic Stage)
- The most frequent stage score
  - ▣ 10.60 (Upper Middle Formal Stage)

**DMI person stage score frequencies**

N	Valid	62
	Missing	13
Mean		10.7774
Minimum		9.60
Maximum		12.00

# Hierarchy DMI Person Score Crosstabulation Results

		DMI_Person_Score					
		9.60	9.80	10.00	10.20	10.40	10.60
Hierarchy	Executive Management	0	0	0	0	0	3
	Middle Management	1	0	0	1	2	5
	Employee	0	1	4	3	5	6
Total		1	1	4	4	7	14

**Hierarchy \* DMI\_Person\_Score Crosstabulation**

Count

		DMI_Person_Score					
		10.80	11.00	11.20	11.40	11.60	11.80
Hierarchy	Executive Management	1	2	1	1	1	2
	Middle Management	1	3	0	0	1	0
	Employee	5	4	4	2	2	0
Total		7	9	5	3	4	2

**Hierarchy \* DMI\_Person\_Score Crosstabulation**

Count

		DMI_Person_Score	Total
		12.00	
Hierarchy	Executive Management	0	11
	Middle Management	1	15
	Employee	0	36
Total		1	62

# Discussion /2

- There are differences in stages between all 3 groups
  - ▣ Executive Managers had the highest mean stage score
  - ▣ Employees the lowest mean stage score
  - ▣ This shows a correlation between an individual's classification under the MHC and the job hierarchy in the organizational structure
- All Executive Managers satisfied the minimum requirement of a supervisor, but not function at the Metasystematic stage as predicted in hypothesis
- Not all Middle Managers satisfied the minimum requirement of a supervisor, but some perform at the same stage as Executive Managers or even on higher stage
- Found some high potentials in group of Employees performing at the same stage as Executive Managers.

# PTI Group Stage Score Means

- Executive Managers group
  - ▣ Upper Concrete stage
  - ▣ 8.94 ( $M = 8.94$ ,  $SD = 1.277$ )
- Middle Managers group
  - ▣ Upper-Middle Abstract stage
  - ▣ 9.64 ( $M = 9.64$ ,  $SD = 1.491$ )
- Employees group
  - ▣ Low- Middle Abstract stage
  - ▣ 9.41 ( $M = 9.41$ ,  $SD = 1.598$ )

**Table : Rasch analysis, PTI\* person score report**

Hierarchy_CLRD	Mean	N	Std. Deviation
Executive Management	8.9455	11	1.27778
Middle Management	9.6400	15	1.49131
Employee	9.4111	36	1.59853
Total	9.3839	62	1.51508

\* Perspective – taking instrument

# PTI Person Stage Score Frequencies – without splitting in 3 groups

- Participants on average performed at the
  - ▣ Low Middle Abstract stage
  - ▣ 9.38 ( $M = 9.38$ ,  $SD = 1.515$ )
- Lowest stage score
  - ▣ 7.00 (Primary stage)
- Highest stage score
  - ▣ 12.00 (Metasystematic)
- The most frequent stage score
  - ▣ 10.20 (Low Formal stage)

## PTI\* person stage score frequencies

N	Valid	62
	Missing	13
Mean		9.3839
Minimum		7.00
Maximum		12.00

\* Perspective – taking instrument

Note: the most frequent stage score was 7.00. The reason for this is that 10 participants repeated the same rating for each vignette with little or no variation. This demonstrated the lack of skill needed to know that each story was not equal. Excluding stage 7, the lowest stage score was Concrete stage.

# Hierarchy PTI Person Score Crosstabulation Results

		PTI_Person_Score					
		7.00	8.00	8.20	8.40	8.60	8.80
Hierarchy	Executive Management	2	0	0	2	1	2
	Middle Management	1	1	1	1	1	2
	Employee	7	2	2	1	1	2
Total		10	3	3	4	3	6

**Hierarchy \* PTI\_Person\_Score Crosstabulation**

Count

		PTI_Person_Score					
		9.00	9.20	10.00	10.20	10.40	10.60
Hierarchy	Executive Management	0	0	0	2	1	1
	Middle Management	0	0	1	2	0	1
	Employee	1	1	1	3	0	5
Total		1	1	2	7	1	7

**Hierarchy \* PTI\_Person\_Score Crosstabulation**

Count

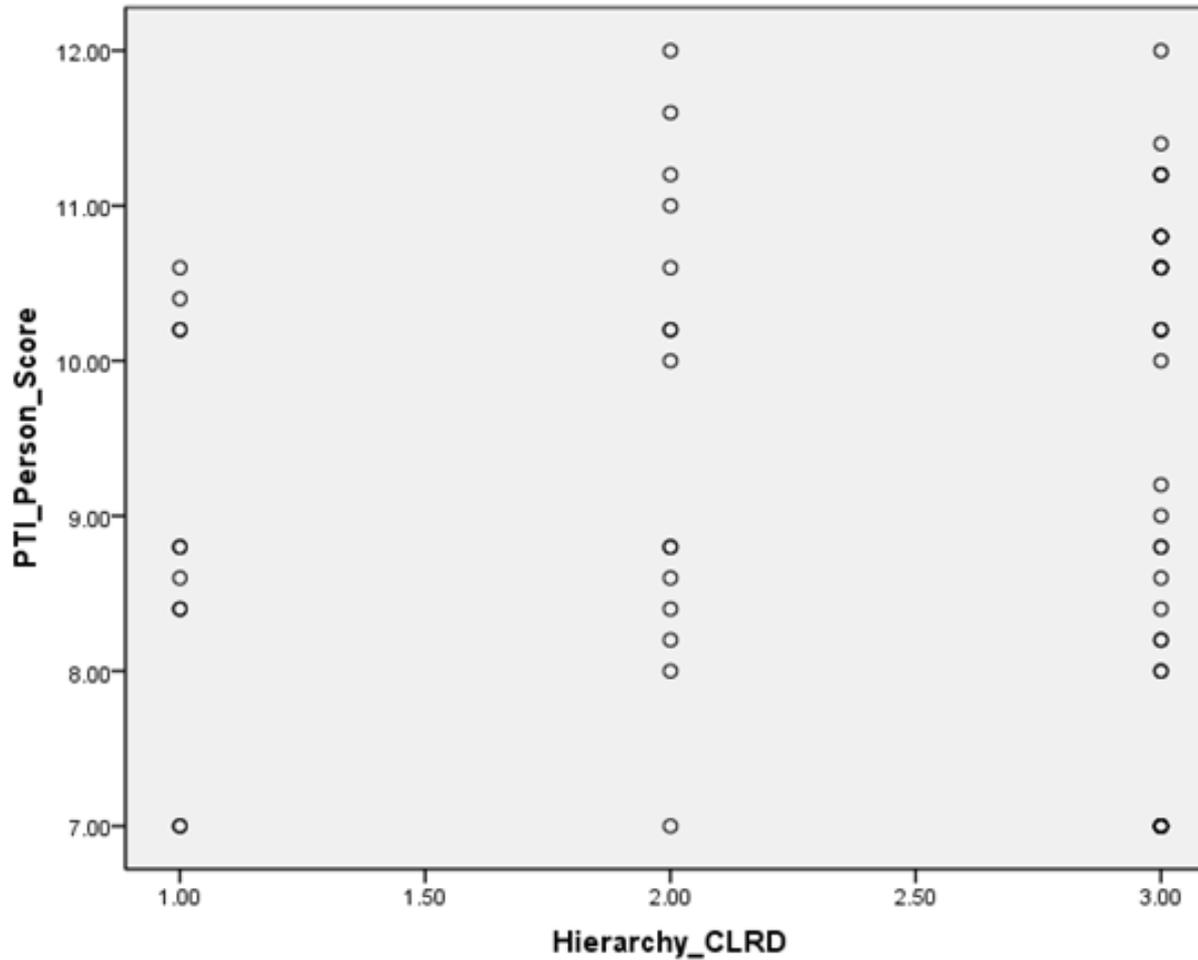
		PTI_Person_Score				
		10.80	11.00	11.20	11.40	11.60
Hierarchy	Executive Management	0	0	0	0	0
	Middle Management	0	1	1	0	1
	Employee	5	0	3	1	0
Total		5	1	4	1	1

# Discussion /3

- There are differences in stages between all 3 groups
  - ▣ Executive Managers did not have the highest mean stage score as predicted, their mean stage score was the lowest of all three groups
  - ▣ The highest mean stage score was by Middle Managers group
  - ▣ There was a very small difference in PTI mean stage scores between Middle Managers and Employees group.
  - ▣ PTI mean stage scores did not show a correlation between individual's classification under the MHC and the job hierarchy in the organizational structure as predicted in hypothesis.
- Overlap and a broad range in the group of Middle Managers and Employees.
- In both groups (Middle Managers and Employees) some participants performed on the stage predicted for Executive Managers. This shows potentials and area for development (see next slide).

# Hierarchy PTI Group Stage Score

Legend: 1.00 Executive Managers 2.00 Middle Managers 3.00 Employees



# Conclusion

- MHC is a framework for scoring how complex behaviour is. It is a framework for scoring reasoning stages in any domain as well as in any cultural setting.
  - ▣ The research supports the fact that the model can be utilized in Slovenia.
  - ▣ MHC offers a new strategic opportunity for Slovene companies, since the model was not yet known in Slovenia before.
  
- According to studies carried out in the Germany, USA, Iraq, the MHC proved to be a legitimate and effective model for measuring task complexity. It has successfully predicted an individual's task performance.
  - ▣ It was carried out in Slovenia for the first time and this proves the above statement of the model being able to score reasoning stages and any cultural setting.

# Conclusion

- MHC was applied in business environment for the first time. This supports the assumption that the model is a framework that can be used in any domain.
- According to studies in the past, carried out worldwide, the MHC proved to be valid and reliable research instrument.
  - ▣ With the research the model was tested again in a new country and in a new domain.
  - ▣ Results from my research once again showed, that the model has validity and reliability.
- In the research, I tested the comparison of the model with another model. The two differed enough to make a meaningful comparison difficult.

# Guidelines and Suggestions in Restructuring the Field of HR

- MHC can be used in the process of selecting new employees. Using the presented instrument could help companies to define standards for required stage of performance according to MHC: This information can be used in the process of selecting new employees.
- In Slovenia, HR experts are very much focused on appropriate education level of employees. Trend outside is focusing on experiences and competences. While using this instrument, this is a chance for HR to start approaching employees differently.
- MHC have an important role as a selection tool for leadership. When managers are not able to perform at the required stage, the outcome is seen in inappropriate leadership and in repeated failures.

# Guidelines and Suggestions in Restructuring the Field of HR

- MHC offers to HR a new tool that allows decisions related to employees taking objectively.
- MHC can be used in recognizing talents and other key employees in the company. This can be further on supported by the appropriate development plan.
- MHC is a step forward in excellence of HR function. It can be used as a supporting tool for EFQM Excellence Model.
- MHC can increase team work and be helpful in establishing project teams.

# Recommendation for Further Research

- To test participants without keeping them anonymous, so that job positions could be perfectly matched to stage performance.
- Research to focus on what are specific development solutions for each stage that can “push” participants up.
- The research was focused on people’s social perspective-taking and decision making. One of the areas that was not researched is ability for ethical behaviour.
- I believe ethics is important in modern business environment and recommendation for further research is to focus on people’s ability for ethical decision-making and behaviour.