

# Analytical, Practical and Emotional Intelligence and Line Manager Competencies

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## Abstract

**Purpose:** The research objective was to examine to what extent line manager competencies are linked to intelligence, and more specifically, three types of intelligence: analytical (fluid), practical and emotional.

**Methodology:** The research was carried out with line managers (N=98) who took part in 12 Assessment Centre sessions and completed tests measuring analytical, practical and emotional intelligence. The adopted hypotheses were tested using a multiple regression. In the regression model, the dependent variable was a managerial competency (management and striving for results, social skills, openness to change, problem solving, employee development) and the explanatory variables were the three types of intelligence. Five models, each for a separate management competency, were tested in this way.

**Findings:** In the study, it was hypothesized that practical intelligence relates to procedural tacit knowledge and is the strongest indicator of managerial competency. Analysis of the study results testing this hypothesis indicated that practical intelligence largely accounts for the level of competency used in managerial work (from 21% to 38%). The study findings suggest that practical intelligence is a better indicator of managerial competencies among line managers than traditionally measured IQ or emotional intelligence.

**Originality:** This research fills an important gap in the literature on the subject, indicating the links between major contemporary selection indicators (i.e., analytical, practical and emotional intelligence) and managerial competencies presented in realistic work simulations measured using the Assessment Centre process.

**Keywords:** selection of managers, competency, practical intelligence, emotional intelligence, analytical intelligence

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## Introduction

In times of dynamic change resulting from the globalisation process (i.e., newly opening markets, growing international competition, mobility of products and production factors, advances in IT and technology and an ageing society (Szmids, 2012), an employee must constantly adapt to uncertain conditions and improve his or her skills to build the market advantage of the firm. Employees constitute the primary capital of every organization without which no organization could operate. Managers are expected to display an increasingly diverse range of attributes and skills (Szaban, 2003). Selection processes have therefore become a major challenge for organizations and well-chosen performance indicators save time and money. It is worth highlighting that human capital includes all the competencies, skills, experience and knowledge of the employees of a given organization, which the firm requires to respond to market and client demands, both in business and public administration, including issues relating to formal and informal leadership (Szaban, 2013).

In line with Koźminski's concept (1996), flexible and active managers (niche finders) act at the "helm" of this capital to seek personal success, overcome market barriers and create a competitive advantage. In terms of organizational development, their activity is focused on increasing efficiency (top performers). But how can one effectively select efficient managers who will, in a complex and uncertain environment, build capital to give the organization a competitive edge? In the literature on the subject, three main indicators of successful leadership stand out as three forms of intelligence: analytical (Schmidt and Hunter, 1998), practical (Sternberg, Hedlund, 2002) and emotional (Rosete and Giarrochi, 2005) as well as the continually explored theme of competencies.

This study dealt with the assessment of line manager competencies and linking them to the three forms of intelligence: analytical, emotional and practical. The author attempted to answer the question: Which lower-level managerial competencies are linked to which forms of intelligence? The link(s) would explain the dependence of the professional competencies of line managers, i.e., the skills determining the effective performance of work duties, on various types of intelligence. If one managerial competency was linked more closely with one type of intelligence, it would be justifiable to make use of tests that examine this type of intelligence in the selection process.

## Professional competencies

Competencies are ubiquitous in today's organizations. On the basis of competencies, organizations perform job evaluations and assign employees to the appropriate levels in the organizational structure, conduct employee appraisals and run the selection process. Although the concept is common in the modern organization, many researchers are repeatedly seen to understand it in very different ways. Table 1 provides the main definitions of competencies given in the literature.

**Table 1.** Definitions of competencies

Scholar	Definition of competencies
Boyatzis (1982)	The underlying characteristics of a person which may include a motive, trait, skill, aspects of one's self-image or social role, or a body of knowledge which he or she uses (p. 21)
Brophy and Kiely (2002)	Skills, knowledge behaviour and attitudes required to perform a role effectively (p. 167)
Parry (1996)	A cluster of related knowledge, attitudes, and skills that: (1) affects a major part of one's job, (2) correlates with performance on the job, and (3) can be improved via training and development (p. 60)
Tell et al. (2000)	An identifiable aspect of prospective work behaviour attributable to the individual (p. 215)
Klemp (1980)	"the underlying characteristic of a person which results in effective and/or superior performance on the job" (p. 21)
Lawler (1994)	Argues that skills are the basic building blocks of competencies and often uses the words interchangeably
Thompson et al. (1997)	Integrated sets of behaviour which can be directed towards successful goal accomplishment (p. 52)
Woodruffe (1992)	The set of behaviour patterns that the incumbent needs to bring to a position in order to perform his or her task and function with competence (p. 17)
Klein (1996)	Refers to observable behaviour that superior performers exhibit more consistently than average performers (Klein, 1996).

Source: own study.

As shown in Table 1, it is not difficult to see that, according to most researchers, competencies are linked to efficiency at work. Therefore one can introduce a definition that competencies are *the combined skills acquired during the course of training which condition the efficient performance of tasks in a job, based on the knowledge, experience*

and predisposition of an individual, and displayed in a sequence of behaviour. It is worth noting the importance of training in developing competencies. Poczowski and many other authors (*inter alia* Listwan, Król, Ludwicyński, Kostera, Rybak) treat training as a basic tool for developing human resources in organizations.

## Analytical (fluid) intelligence

Analytical (fluid) intelligence is treated as innate, genetically determined, untaught intellectual potential. This concept was first described in the theory of Charles Spearman (1927), and was later developed by Raymond Cattell (1971). Analytical intelligence is reflected in the speed of thought processes, which is linked to the speed and quality of nerve impulses sent in neurons. It is displayed in intelligence tests mainly through solving non-verbal tasks (such as building blocks, spatial imagination, ability to rotate shapes in the mind, etc.), as well as vocabulary tests (e.g. testing the number of words known). It reaches its prime towards the end of puberty (at around 20–25 years of age).

This type of intelligence is the most widely studied and validated indicator of professional and educational performance (Brody, 2000; Schmidt and Hunter, 1998). This suggests that analytical intelligence is an important factor in assessing professional achievement in times where the nature of work is becoming more complex and unpredictable (Gottfredson, 1997; Snow and Snell, 1993).

The traditional view ((Brand, 1996; Schmidt and Hunter, 1998; Jensen, 1998; Ree and Earle, 1993; Spearman, 1927) assumes that many competencies stem from analytical intelligence and that it should be used in the selection process as it is a well-tested and convincing indicator of performance and learning in various professions (Schmidt and Hunter, 1998; Brody, 2000).

## Emotional intelligence quotient

The emotional intelligence quotient (EQ), or emotional intelligence (EI), is understood as the personal competency of an individual in terms of ability to recognize the emotional state of oneself and others, as well as the ability to use one's own emotions and cope with the emotional states of other people (Zeider, Moshe and Roberts, 2004).

Mayer and Salovey mentioned four areas that make up emotional intelligence: (1) perceiving emotions, (2) using emotions to assist thinking, (3) understanding emotions and

(4) managing emotions. According to Bar-Ona, emotional intelligence consists of five elements: (1) intrapersonal intelligence, (2) interpersonal intelligence, (3) coping with stress (4) ability to adapt and (5) general mood (Zeider, Moshe and Roberts, 2004).

According to Goleman (1997) emotional intelligence encompasses the ability to understand oneself and one's own emotions, the ability to manage and control emotions as well as self-motivation, empathy and social skills. Within this form of intelligence, he included three main groups of competencies: (1) psychological competencies (one's relationship with oneself) of self-awareness, self-evaluation, self-control or self-regulation; (2) social competencies (relations with others) of empathy, assertiveness, persuasion and cooperation; and (3) praxeologic competencies (one's attitude to tasks, challenges and action) of motivation and ability to adapt.

In 1997, Claudio Fernandez-Araoz, in a branch office of Egon Zehnder International in Buenos Aires (Goleman, 1999), who was looking for managerial staff in South America, compared 227 managers at various levels who had achieved success in their professions with 23 managers who had been unable to achieve such success. The research revealed that the group of 23 managers were almost always distinguished by a high intelligence quotient and high level technical competencies. However, towards their colleagues, they were arrogant, all their activities and decisions were based on knowledge alone and they were not able to work in a team or in collaboration with others. The result of the research showed that a lack of emotional intelligence prevents the achievement of professional success, despite a high intelligence quotient as well as great practical knowledge.

At the University of California in Berkeley (Goleman, 1999) in the 1950s, a set of tests was conducted on the intelligence quotient as well as personality tests and individual interviews with 80 PhD students. During the study, they were assessed for effectiveness, maturity and emotional stability in interpersonal relationships. At the beginning of the 1990s, the same group of PhD students underwent further research assessing their professional success. The results of the new study showed that their emotional skills were four times more important in achieving success than the intelligence quotient.

Baczyńska and Górniak (2013) performed a study on a group of debt collectors. They tested whether there was a link between the level of emotional intelligence, social competencies and the results of the debt collectors' work. They obtained the following relationships: emotional intelligence with efficiency  $r = 0.85$ ;  $p < 0.001$ ; a positive relationship with efficiency of influence  $r = 0.57$ ;  $p < 0.001$ ; and a positive relationship with efficiency of agreement  $r = 0.68$ ;  $p < 0.001$ . They confirmed that there exists a positive

relationship between the level of emotional intelligence and the results of the debt collectors' work.

The studies conducted by Goleman showed that the most important social skill for employees is the ability to communicate effectively. Employees who already possessed good communication should combine this with the ability to work in a team, serving to achieve team objectives (Śmieja and Orzechowski, 2008).

Furthermore, researchers have shown that an individual's social skills are one of the most important traits necessary to achieve professional success. A high level of social competencies has particular significance both for entrepreneurs and managers. Social skills often determine success during recruitment interviews as well as professional success (Śmieja and Orzechowski, 2008).

## Practical intelligence

Numerous studies confirmed the theory that success at work is assisted by other factors than the traditionally defined fluid intelligence (Sternberg, Kaufman and Grigorenko, 2008). Life provides plenty of evidence showing that defining intelligence mainly in the category of academic ability is too narrow (Sternberg and Hedlund, 2002). In his 1985 book "Beyond IQ," Sternberg suggested a new approach, widening the concept of analytical intelligence with practical intelligence.

Practical intelligence is, according to Sternberg, the ability of individuals to seek an ideal fit between themselves and the demands of a situation. This ability allows a person to quickly adapt or adjust, or ultimately to seek a new environment, in the context of realizing important personal life goals (Sternberg, 1985).

The difference between analytical and practical intelligence is comparable with the difference between the two kinds of knowledge. Practical intelligence is the ability to acquire knowledge through one's own "backyard" life experience, in the so-called school of life (informal, tacit knowledge). This type of knowledge is of a procedural nature (know-how), not conceptual, abstract or explanatory (know-what). It is a form of "hot" knowledge, which is very useful in achieving personal goals. Practical intelligence is often colloquially termed "common sense," intuition, or business acumen (Stern et al., 2000; Sternberg and Wagner, 1993; Sternberg, Wagner and Okagaki, 1993; Sternberg et al., 1995; Uchnast, 2006; Wagner, 1987; Wagner and Sternberg, 1985; 1986; Sternberg and Caruso, 1985).

Research into practical intelligence has been conducted in many countries, in various social groups and in very different life contexts. Outlined below are those that refer to the link between practical intelligence and managerial work.

Colonia-Willner (1998) used a Tacit Knowledge Inventory for Managers (TKIM) survey and intelligence tests (verbal comprehension) to examine bank managers. She showed that the results of TKIM were linked to important competencies, while verbal comprehension tools did not indicate these skills.

From the definition of competencies, it follows that high-level professional competencies are linked to efficient performance of work tasks. Success may therefore be considered as variable, which testifies to the possession of the competencies necessary to achieve it.

Sternberg and his colleagues (2000; 2002) showed a strong positive correlation between managerial success, experience and practical intelligence.

Wagner and Sternberg (1985) showed a significant correlation between the results of practical intelligence among 54 managers with their positions in the organization,  $r(54) = .34, p < .05$  as well as with years of study,  $r(54) = .41, p < .01$ . In supplementary studies on managers ( $N = 49$ ), Wagner (1987) found a significant correlation between the results of tacit knowledge with years of managerial experience,  $r(49) = .30, p < .05$ .

In further studies of managers, Williams and Sternberg (Sternberg et al., 2000) showed that practical intelligence correlates positively with the number of organizations where the manager had worked ( $r = .35$ ) and the position in the firm ( $r = .36$ ). The number of years the manager spent in his or her current organization was negatively associated with tacit knowledge ( $r = -.29$ ). This finding may indicate that the best managers change jobs within the market and work for different organizations during their professional careers.

Other studies of military leaders showed that practical intelligence results do not correlate with the number of months that they have served in their current positions (see Sternberg et al., 2000). It correlated significantly with the rank of the leaders in two versions of the tacit knowledge test,  $r(42) = .44, p < .01$  and  $r(37) = .41, p < .05$ , where leaders of a higher rank and greater leadership experience achieved better results than lower ranking leaders (Hadlund, Sternberg and Psotka, after Sternberg et al., 2000). Similar results were obtained by Tesluk and Jacobs (1998). The above research leads to the interesting conclusion that it is not experience that plays the more important

role, but rather what conclusions are drawn from it and what lessons are learned as a result.

Subsequent studies by Wagner and Sternberg (1990) showed practical intelligence tests to be more accurate than fluid intelligence tests as indicators of professional achievement among managers at higher levels. They claimed that the results of the TKIM correlates significantly with the competencies assessed in work simulations of managers  $r(45) = .61, p < .01$ . Moreover, tacit knowledge test results explained 32% of managerial achievement compared with results obtained in traditional intelligence tests.

Similar results were obtained by Baczyńska and Wekselberg (2013). They compared groups of managers with high competency scores obtained in the Assessment Centre with the results obtained from TKIM. They found important differences between the groups. According to the definition, competencies are abilities that determine the efficient execution of work tasks and therefore are the driving force for achieving success in an organization. The link between practical intelligence and competencies at work appears to be particularly interesting.

## Research objective

Analytical intelligence is the most widely studied and validated indicator of professional and educational performance (Brody, 2000; Schmidt and Hunter, 1998) and practical and emotional intelligence is a proven determinant of professional success (Wagner and Sternberg, 1985; Wagner et al., 1999). It was therefore decided to find out to what extent managerial competencies examined using the Assessment Centre method are linked to intelligence, and specifically, three forms of intelligence: fluid (analytical), practical and emotional.

It was assumed that the strongest indicator of managerial competencies is practical intelligence, which is linked in a similar way to competencies with procedural knowledge (know-how). The source of knowledge for persons with practical intelligence is their ease of acquiring and utilizing “life” knowledge, which Sternberg calls “tacit knowledge.” Tacit knowledge means knowledge focused on action, acquired without direct help from others (Horvath et al., after Sternberg, 1995) and use of this knowledge appears to be extremely important in the development of an individual’s competencies in the real world. Competencies developed via training should be linked most strongly to practical intelligence. In this study, the following research hypothesis was adopted:



*Practical intelligence linked with procedural/tacit knowledge is the best indicator of achievement in assessments of managerial competencies among line managers.*

## Method

### Research sample

The study was carried out on a sample of 98 line managers. All participants were at the start of their managerial careers in organizations and held positions such as section leader, section manager, team manager, etc. Their management roles relied mainly on managerial functions such as planning, organizing, leadership and control (Koźmiński and Piotrowski, 2002). They were employed in production, automotive, fast-moving consumer goods and domestic appliance companies operating throughout Poland. They had little experience in operational management positions. The length of time spent in a managerial position in the research sample was between one month and two years.

The age of the research group varied from 25 to 35 years. The average age of participants was 28 ( $SD = 4.06$ ). 54 women were studied ( $M_{age} = 30$ ;  $SD_{age} = 4.65$ ) along with 44 men ( $M_{age} = 29$ ;  $SD_{age} = 4.77$ ).

## Research tools

### Measurement of managerial competencies

Participants took part in a one-day Assessment Centre (AC)<sup>2</sup> session during which managerial competencies were measured. In the course of the AC session, five competencies were assessed:

- 1) **Management and striving for results.** Striving to direct the course of work or people, organizing the activities of individuals and teams, aiming for top performance (planning, organizing, control), taking the initiative and pursuing targets despite encountering setbacks.
- 2) **Social skills.** Communicativeness (verbal and non-verbal), assertiveness, conscious and intentional exertion of influence on others without manipulation and supporting team collaboration.

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<sup>2</sup> Assessment Center is an extensive method of measuring the competencies of candidates consisting of work-related simulations. It usually lasts 1 to 2 days.

- 3) **Openness to change.** Taking responsibility for decisions made and introducing new solutions, representing the company strategy before employees and flexibility in situations of change.
- 4) **Problem solving.** Ability to analyse a situation, correctly diagnose the causes and effects of problems that occur and actively seeking the best solutions.
- 5) **Employee development.** Striving to develop the competencies and motivation of staff and to create favourable conditions for improving the efficiency of employees.

**Table 2.** Study of the distribution of managerial competencies tested

Managerial competencies	Min	Max	M	SD	Bias	Kurtosis
Management and striving for results	3.00	10.00	6.14	1.56	.450	-.380
Social skills	3.00	10.00	6.71	1.20	.090	.509
Openness to change	4.00	10.00	6.28	1.47	.390	.006
Problem solving	3.00	10.00	6.21	1.45	.259	-.601
Employee development	3.00	10.00	5.81	1.45	.610	.081

*Annotations.* *M* – average score in group, *SD*- standard deviation in group.

Source: own elaboration.

### Measurement of practical intelligence

The study uses the Tacit Knowledge Inventory for Managers – TKIM) of Wagner and Sternberg (1991) in a Polish version adapted by Baczyńska and Terelak (2009). The reliability of this tool is acceptable (Cronbach alpha – 0.88). The TKIM is a decision-making situation test. The questionnaire contains 9 situations and 91 solutions. Participants evaluate individual, alternative solutions on a seven-point scale and choose what they consider to be the best option in a given context.

The participants' answers are assessed by comparing them with the answers of expert managers. Middle managers regarded as having a model profile for the study were carefully selected in terms of their achievements in an organization (results at work) and who were considered as authorities in their field within their corporations (high scores in performance reviews or 360 degree feedback).

Scores above 90% were treated as very high (very good fit with the model), from 85 to 90% as high (good fit), from 80–85% as medium (medium fit) and below 80% as low (weak fit). The scores of the research group ranged from 63% to 97% ( $M_{TKIM} = 82,76\%$ ;  $SD_{TKIM} = 7,27$ ). The distribution of results came within the normal distribution boundaries.

The standard version of Raven's Progressive Matrices test was used in the study to measure general intelligence. In an abstract set of images (geometrical shapes), the participant must discover the relationship between elements of the pattern (matrix) and indicate the missing element from those given. The maximum score is 60 points. The scores in the research group ranged from 38 to 60 points ( $M_{Raven} = 51.28$ ;  $SD_{Raven} = 5.73$ ). The distribution of results came within the normal distribution boundaries.

### Measurement of emotional intelligence

A questionnaire was drawn up by Salovey and Mayer. In 2005, Matchak, Jaworowska, Ciechanowicz, Stańczak and Zalewska prepared a Polish version called the Common Emotional Intelligence Survey (Popularny Kwestionariusz Inteligencji Emocjonalnej). The questionnaire consists of 94 points and takes the form of a self-reporting inventory. The participant marks on a five-degree scale the extent to which each statement refers to him or herself.

The questionnaire makes it possible to calculate the results in four factor scales as well as the overall score. The scales used in the Common Emotional Intelligence Survey are: (1) acceptance, expression and utilization of one's own emotions in actions; (2) empathy, i.e., understanding and recognizing the emotions of others; (3) control, also recognition, of one's own emotions; and (4) understanding and being aware of one's own emotions.

**Table 3.** Study of the distribution of emotional intelligence variables

Emotional intelligence measures	Min	Max	M	SD	Bias	Kurtosis
Empathy	38.00	89.00	69.19	8.84	-.499	1.337
Control of emotions	14.00	52.00	34.71	8.68	-.108	-.561
Acceptance of emotions	32.00	71.00	57.00	7.80	-.915	.879
Understanding of emotions	22.00	49.00	34.92	5.07	.257	-.288

Source: own elaboration.

## Research procedure

The design of the Assessment Centre was based on the principles drawn up in May 2000 in San Francisco and updated annually during the International Congress on Assessment Centre Methods by researchers and practitioners of the Assessment Centre method (Baczyńska and Wekselberg, 2009). All the competencies were created with the participation of expert judges and the rules for conducting the sessions and observing participants were also conducted according to the AC principles.

The competency levels were defined using the expert judges' method. The scale adopted for measuring competency consisted of 10 levels:

- Levels 1–2 indicated a lack of the desirable behaviour and domination of undesirable behaviour; consistent undesirable behaviour in a variety of situational contexts;
- Levels 3–4 signified attempts at desirable behaviour, in easy situations occasional incidents of desired behaviour; lack of consistent behaviour in different situational contexts;
- Levels 5–6 where desirable behaviour dominates, consistent desirable behaviour in standard, simple situations; in difficult situations, undesirable behaviour appears;
- Levels 7–8 indicated lasting desirable behaviour, repeated in different situational contexts, also in difficult tasks, and desirable behaviour is clearly presented;
- Levels 9–10 where desired behaviour dominates showing system solutions and suggestions for solving problems.

In each AC study, there were two group simulations such as a group discussion without a leader; a discussion group with assigned roles; and two pair-work simulations (e.g., a conversation with an employee or a conversation with a colleague). Each competency was observed in at least two tasks and each participant was observed in each task by at least two assessors. The session was conducted in accordance with the guidelines outlined above. In total, 12 sessions were conducted.

During the AC session, participants performed a battery of pen and paper tests, which included an Inventory of Practical Intelligence for Managers, the Raven's Progressive Matrices test measuring analytical intelligence and the Emotional Intelligence Survey.

## Results

To test the study hypothesis, a multiple regression model was used. The dependent variable was the given managerial competency and the explanatory variables were the three types of intelligence, i.e., analytical, emotional and practical. In this way, five models were tested separately for each managerial competency. The first competency to be tested was *management and striving for results*.

The adopted model was statistically significant ( $R=0.55$ ; adjusted  $R^2=0.219$ ;  $F(6)=3.574$ ;  $p < 0.01$ ). The table below presents the regression weights for all the explanatory variables for the three forms of intelligence.

**Table 4.** Standardized beta weights for the dependent competency: Management and striving for results,  $N = XC$

	beta	t	p
<b>Analytical intelligence</b>	-.044	-.338	.737
<b>Practical intelligence</b>	.514	4.032	.000
<b>Empathy</b>	-.122	-.842	.404
<b>Control of emotions</b>	.114	.729	.469
<b>Acceptance of emotions</b>	.232	1.361	.180
<b>Understanding of emotions</b>	-.135	-.696	.489

Annotation. Standardized beta weights, t – Student t test value, p – significance level of Student t test.

Source: own elaboration.

The regression results showed that only one explanatory variable was statistically significant: practical intelligence. In the adopted model, it explains 21% variation in *management and striving for results*. In the next model tested, the dependent variable was Social Skills.

The adopted model was statistically significant ( $R = 0.675$ ; adjusted  $R^2=0.389$ ;  $F(6) = 6.829$ ;  $p < 0.00$ ). The table below presents the regression weights for all the explanatory variables, that is, the three forms of intelligence.

**Table 5.** Standardized beta weights for the dependent variable: Social skills, N = XC

Model	Standardized Coefficients	t	p
	Beta		
(Constant)		-1.311	.196
Analytical intelligence	-.008	-.068	.946
Practical intelligence	.638	5.656	.000
Empathy	-.091	-.707	.483
Control of emotions	.015	.106	.916
Acceptance of emotions	.138	.916	.364
Understanding of emotions	.025	.145	.885

Source: own elaboration.

The regression results showed that only one explanatory variable was statistically significant, that is, practical intelligence. In the adopted model it explains 38% variation in the competency of Social skills. In the next model tested, the dependent variable is *openness to change*.

The adopted model is statistically significant ( $R=0.616$ ; adjusted  $R^2=0.303$ ;  $F(6)=4.984$ ;  $p < 0.00$ ). The table below presents the regression weights for all the explanatory variables for the three forms of intelligence.

**Table 6.** Standardized beta weights for the dependent competency: Openness to change, N = XC

Model	Standardized Coefficients	t	p
	Beta		
(Constant)		-1.438	.157
Analytical intelligence	-.069	-.554	.582
Practical intelligence	.637	5.286	.000
Empathy	.024	.175	.862

Table 8 (Continued)

Model	Standardized Coefficients	t	p
	Beta		
Control of emotions	.168	1.136	.262
Acceptance of emotions	.115	.713	.479
Understanding of emotions	-.175	-.957	.343

Source: own elaboration.

The regression results showed that only one explanatory variable was statistically significant: practical intelligence. In the adopted model, it explains 30% variation in *openness to change*. In the next model tested, the dependent variable is *problem solving*.

The adopted model is statistically significant ( $R = 0.637$ ; adjusted  $R^2 = 0.333$ ;  $F(6) = 5.580$ ;  $p < 0.00$ ). The table below presents the regression weights for all the explanatory variables for the three forms of intelligence.

**Table 7.** Standardized beta weights for the dependent variable: Problem solving  $N = XC$

Model	Standardized Coefficients	t	p
	Beta		
(Constant)		-1.745	.087
Analytical intelligence	-.007	-.062	.951
Practical intelligence	.601	5.105	.000
Empathy	-.016	-.123	.903
Control of emotions	.038	.264	.793
Acceptance of emotions	.148	.938	.353
Understanding of emotions	.039	.219	.827

Source: own elaboration.

The regression results showed that only one explanatory variable is statistically significant: practical intelligence. In the adopted model, it explains 33% variation in *problem solving*. In the next model tested, the dependent variable is *employee development*.

The adopted model is statistically significant ( $R=0.620$ ; adjusted  $R^2 = 0.308$ ;  $F(6) = 5.089$ ;  $p < 0.00$ ). The table below presents the regression weights for all the explanatory variables for the three forms of intelligence.

**Table 8.** Standardized beta weights for the dependent competency: Employee development,  $N = XC$

Model	Standardized Coefficients	t	p
	Beta		
(Constant)		-1.766	.084
Analytical intelligence	.121	.983	.330
Practical intelligence	.590	4.919	.000
Empathy	.079	.576	.567
Control of emotions	.105	.710	.481
Acceptance of emotions	.098	.610	.545
Understanding of emotions	-.240	-1.315	.195

Source: own elaboration.

The regression results showed that only one explanatory variable was statistically significant: practical intelligence. In the adopted model, it explains 30% variation in *employee development*.

## Discussion

The main objective of the study was to test to what extent certain types of intelligence (analytical, practical and emotional) account for the level of managerial competencies of line managers. The hypothesis adopted was that practical intelligence, linked to procedural, tacit knowledge, is the strongest indicator of managerial competency. Analysis of the research results obtained verified this hypothesis and support the assertion that to a large degree, practical intelligence accounts for the level of managerial competencies used in the work of managers (from 21% to 38%).

Similar results were obtained by Baczyńska and Wekselberg (2013), when comparing practical intelligence scores with managerial competencies. i.e. leadership, communi-



cation and cooperation, initiative, developing employees, results orientation, customer orientation, influence and impact measured in the AC process. On the basis of the results obtained, it can be concluded that persons with numerous successes in the field of management (holding managerial positions, which in this culture rates as success) and exhibiting a high level of practical intelligence, will display high levels of managerial competencies. It can also be acknowledged that competencies are to a greater degree linked to procedural, tacit knowledge (know-how), rather than to analytical skills.

The assumption that analytical and practical skills are acquired in different ways is supported by the research of Denney and Palmer (1981). They studied adults aged between 20 and 79 years. Two forms of reasoning were studied: traditional, measured using The Twenty Questions task (Hostner and Hornsby, 1966; Necka, 2003); and problem solving in real life situations (e.g. "If you were travelling by car on the motorway and were unexpectedly hit by a snow storm, what would you do?"). Denney and Palmer showed that performance in solving traditional problems, and thus performance measured in a traditional way, declines steadily from age 20 onwards. Performance in solving practical problems improves up to the age of 20–50 years of age and then weakens.

Similar results were achieved by Cornelius and Capi (1987). They studied the relationship between analytical, crystallized intelligence and everyday problem solving. They measured these abilities using sample questionnaires from different areas of life: consumer problems (a landlord who doesn't carry out repairs); information seeking (additional data are needed to fill in a form); personal matters (you want to go to a concert but you are not sure if it's safe); family problems (responding to criticism from parents or children); friendship issues (persuading a friend to visit you more often); and professional problems (you have missed getting a promotion). Cornelius and Capi showed that performance in terms of fluid ability increases with age until 20–30 and then remains at the same level until 30–50 years of age, when it begins to decline; performance in solving everyday problems and the level of crystallized intelligence increases until 70 years of age. They showed a slight relationship between fluid intelligence, everyday problem solving ( $r = .29$ ;  $p < .01$ ) and crystallized ability ( $r = .27$ ;  $p < .01$ ), which indicated that the ability to solve real-life problems does not weaken along with crystallized intelligence, although they develop in a similar way.

The research to date shows that since achievement in practical problem solving is determined to a lesser extent by analytical intelligence (IQ), so use of traditional tests of cognitive ability to predict real-life problem solving is problematic (Scribner, 1984; Lave, Murtaugh and de la Roche, 1984; Murtaugh, 1985; Carraher, Carraher and Schliemann, 1985; Doner, Kreuzig, Reiter and Strudel, 1983). This conclusion seems a little

too bold, however, since the managers examined in this study possessed a high IQ ( $M_{Raven} = 51.28$ ;  $SD_{Raven} = 5.73$ ). They possessed eighth level intellects, indicating a high level of analytical intelligence. One can therefore assume that intelligent persons become managers and this represents an initial selection process in an organization. However, this level was not sufficient to give high level competencies in the work-related simulations studied.

This may be connected with role-related training, which is emphasized by researchers such as Pocztowski, Listwan, Król, Ludwiczynski, Kostera and Rybak and which is linked to procedural knowledge. Based on the research, one can state that practical competencies are linked more closely to tacit knowledge, which underlies practical intelligence, than to intellect and assert that practical intelligence is a better indicator of managerial competency among line managers than traditional measurements of IQ or emotional intelligence.

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