

## First Results from Verification of Psychometric Properties of D. Lennick's and F. Kiel's MCI Questionnaire for Measuring Moral Intelligence in Slovak Conditions

### Abstract

The scientific study theoretically and empirically verifies the new construct of moral intelligence. Following its theoretical analysis, it offers the first findings from verification of psychometric properties of the tool for measuring moral intelligence, the *Moral Competence Inventory (MCI)* by D. Lennick and F. Kiel. Factor analysis of the Slovak version of the *MCI* proved the existence of 15 factors with acceptable variability, which, however, is not in agreement with 10 factors determined by the authors. Also, its insufficient reliability (in terms of internal consistency and stability of results in time (test-retest reliability estimate)) indicates that the current form of the *MCI* should be subjected to further scientific-research verification.

**Keywords:** *moral intelligence, MCI questionnaire by D. Lennick and F. Kiel, reliability, factor structure*

Several scientific disciplines (psychological, philosophical, educational, sociological ones or those of natural sciences) have operationalized the construct of intelligence for over a century. Analysis of this construct still belongs to the most verified aspects of the psychic reality of human personality. In general, it is concluded that intelligence is the ability to learn from experience, remember, identify concepts and their relations, penetrate by thinking to the heart of a problem, but also the ability do adapt, requiring various types of adjustment in various social and cultural contexts. The essence of new theories includes not only cognitive

abilities, but also emotions (emotional intelligence), common sense (practical intelligence), creative abilities (creative intelligence), social skills (social intelligence), volition, wisdom, and the individual's morality (moral intelligence) are emphasized. It has to do with the socio-personality approach in the research into intelligence (Ruisel, 1999) focused on the outer world of social interactions and social structures, on the role behaviour in social systems and on maintenance and development of human relations.

At the turn of the century, **the concept of moral intelligence** began to be accepted and theoretically and empirically verified. Researchers (Gardner, Borba, Lennick, Kiel, Cole, Bradshaw, Pana, Mueller, Ricoeur, Dobrin and others) worked with this concept and found it useful. Already H. Gardner (1986), when creating his theory of multiple intelligence types, suggested that the concept of moral intelligence might be worth including in it.

At present, there are three directions formed that analyse its existence. The first group consists of theoreticians of philosophical sciences (Kučkovský, Dobrin, Norcia, Kučkovský and others) building on Darwin's theory and his evolutionary view of ethics. Ch. Darwin associates morality with aspects of social life, where the sense of morality evolves in combination of social instincts and well-developed mental processes. Their connection gives rise to the concept of **moral intelligence** because only a moral being is "*capable of comparing his past and future actions and motives and of approving or disapproving of them*" (Darwin, 1981 in Di Norcia, 2011, p. 11), and subsequently of adapting his behaviour to changing social conditions.

The second group of opinions on the concept of **moral intelligence** is based on educational counselling. The first definition of the concept of moral intelligence can be found in the publication "*Doing the Right Things: Cultivating Your Moral Intelligence*" (1999) by A. Hass. In the context of moral behaviour analysis, he drew attention to the existence of moral intelligence as the ability not only to think morally, but also to act morally. In his opinion, moral behaviour requires analysis, understanding and emotional empathy (Hass, 1999), which leads to facilitation of the ability to think morally. Another theoretical analysis is offered by M. Borba in her book "*Building Moral Intelligence*" (2001), R. Coles in "*The Moral Intelligence of Children*" (1997) and J. Bradshaw in "*Reclaiming Virtue: How We Can Develop the Moral Intelligence to Do the Right Thing at the Right Time for the Right Reason*" (2009). They emphasize personality, social, cognitive, emotional and moral skills building a strong human character and forming moral behaviour. They define **moral intelligence** as the capacity to understand right from wrong, to have strong ethical convictions and to act on them. They say that every one of us has an innate

predisposition for moral intelligence, which constitutes an internal control system of our conduct. It has to be developed and cultivated purposefully by teachers and parents through discussions with moral dilemmas.

The last group of opinions is determined by pragmatic social needs where the essential element to individual and social well-being and progress is facilitation of intelligence important in application of ethical principles. Some experts (Boss, 1994) perceive the importance of moral intelligence as a vital part of human nature, the significance of which grows in the economic sector. In their book “*Moral Intelligence: Enhancing Business Performance & Leadership Success*” (2008) D. Lennick and F. Kiel (2008) define it as the “*mental ability to determine how universal human principles should be applied to our personal values, goals and actions*” (2008, p. 7). They assert that everyone has an innate moral compass as an internal predisposition to distinguish right from wrong. In their theory (2008), they focus on four primary characteristics essential for sustained personal and organizational success. These include: *integrity* - facilitating conduct by universal principles, *responsibility* for one’s own actions and their consequences, ability to *forgive* and *tolerate* one’s own mistakes as well as those of others and *compassion* for all living things. Connection of these elements with the application of the “golden rule of morality” forms the moral compass of an individual.

In addition to the theoretical analysis of the concept of moral intelligence, they also worked out a tool for assessment of a moral quotient, i.e. a representative of moral intelligence consisting of 10 moral competences. The *Moral Competence Inventory (MCI)* is a self-reporting method. It consists of 40 items rated by probands on a five-point Likert scale. The inventory returns the *MCI* total score in the range of 20–100 interpreted as: 100–90 points - high level, 89–80 very good level, 79–70 - good level, 69 and less - insufficient level of moral intelligence. It also analyses 10 individual moral competences facilitating moral intelligence in situations of a moral dilemma. Moral competences in the *MCI* include: *integrity* (p representing the *MCI* item: p1, p11, p21, p31), *honesty* (p2, p12, p22, p32), *justice* (p3, p13, p23, p33), *keeping promises* (p4, p14, p24, p34), *responsibility* (p5, p15, p25, p35), *self-control* (p6, p16, p26, p36), *willingness to help others* (p7, p17, p27, p37), *care for others* (p8, p18, p28, p38), *empathy* (p9, p19, p29, p39) and *spirituality* (p10, p20, p30, p40).

Since neither on the Czech and Slovak nor on the global scale is there a tool for measuring moral intelligence, our primary goal was to verify the basic psychometric properties of the *MCI*. They had not been verified by the authors so far. However, e.g. E. Martin and B. Austin tried to do so (2008, 2010). However, pos-

sible application of the *MCI* should also be considered: whether for informative, diagnostic or counselling purposes for professional or educational community; or for scientific research purposes only, and in our cultural environment.

We posed the following research questions:

*RQ1: What is the reliability of the MCI in terms of internal consistency of the tool and its 10 dimensions, and stability of the tool of the results obtained in time (test-retest reliability estimate)?*

*RQ2: Is it possible to extract 10 factors from the MCI by factor analysis, as the authors of the inventory claim?*

The research sample, formed by combination of convenience and grab sampling, consisted of 209 students of upper secondary education - 9 schools in the region of Banská Bystrica in the SR. The average age of the students was 17.22 (SD = 1.21). More detailed characteristics of the research sample in terms of demographic data are presented in Table 1; although 7 participants did not indicate their gender and 23 their religion, they were included in the total analysis. The data were collected in 2012–2013.

**Table 1.** Research Sample Characteristics

	1 <sup>st</sup> grade	%	3 <sup>rd</sup> grade	%	4 <sup>th</sup> grade	%	Total	%
Total	48	22.97	89	42.84	72	34.45	209	100
Boys	17	37.78	27	30.68	20	28.99	64	31.68
Girls	28	62.22	61	69.32	49	71.01	138	68.32
Believers	35	87.50	78	90.70	36	60.00	149	80.12
Atheists	5	12.50	8	9.30	24	40.00	37	18.88

Based on testing the distribution of variables for normality by the Kolmogorov-Smirnov test, non-parametric procedures were preferred in the statistical analysis.

Table 2 presents descriptive indicators of the variables and significance of differences in 10 competences and the total level of moral intelligence of our research sample and US probands from the only research study aimed at verification of the *MCI* in USA, carried out by E. Martin and B. Austin (2010).

It can be concluded that our students achieved a significantly lower level of perception and assessment of justice ( $p \leq 0.5$ ) and highly significantly lower level of self-control and empathy ( $p \leq 0.01$ ) than the US students. However, their total level is comparable with that of the US students - a *good* level of moral intelligence (in the range of 70–79).

**Table 2.** *MCI* Descriptive Indicators and Significance of Differences in the *MCI* in our and US probands

Descriptive Indicators of the <i>MCI</i> questionnaire							
MCI Dimensions	Slovak probands (N = 209)				US probands (N = 171)		
	Min	Max	AM	SD	AM	SD	p
Integrity	8	20	15.31	2.27	16.45	2.73	0.816
Honesty	9	20	15.56	1.97	16.72	2.33	0.067
Justice	5	20	13.70	2.56	14.65	2.68	0.036*
Keeping promises	8	20	16.21	2.20	16.56	2.36	0.794
Responsibility	7	20	15.47	2.23	16.36	2.36	0.050*
Self-control	7	19	13.39	2.63	16.33	2.53	0.000***
Willing to help	6	20	14.02	2.43	14.95	2.91	0.315
Care for others	9	20	14.88	2.48	15.74	3.03	0.236
Empathy	5	18	12.02	2.29	15.07	2.57	0.000***
Spirituality	5	20	14.10	2.76	14.83	2.88	0.913
MCI total score	55	89	72.32	7.20	76.99	7.03	0.852

\* $p \leq 0.05$  \*\* $p \leq 0.01$  \*\*\* $p \leq 0.001$

*RQ1: What is the reliability of the MCI in terms of internal consistency of the tool and its 10 dimensions, and stability of the tool of the obtained results in time (test-retest reliability estimate)?*

The *MCI* reliability was assessed based on the statistical estimate of the level of internal consistency of the tool and its 10 dimensions, calculating Cronbach's alpha (Table 4); and based on the stability of the tool of the obtained results in time (test-retest reliability estimate), calculating Spearman's correlation coefficients between results of two measurements within four months in 28 probands (Table 3).

Based on the analysis of test-retest stability, the level of which is  $0.207 \leq \zeta \leq 0.677$ , and internal consistency in the range of  $0.198 \leq \alpha \leq 0.578$ , it can be concluded that these values of the tool reliability are in both cases unacceptably low for professional community.

**Table 3.** Test-Retest Stability of the *MCI* Questionnaire and its Dimensions in Time

	$\zeta$
Integrity	0.513
Honesty	0.677
Justice	0.207
Keeping promises	0.413
Responsibility	0.341
Self-control	0.434
Willing to help	0.591
Care for others	0.676
Empathy	0.652
Spirituality	0.544
MCI total score	0.594

Due to the very low alpha values in the Honesty and Empathy dimensions, indicating internal inconsistency of these items, also mutual relations were assessed of individual items of the Honesty dimension (Table 5) and the Empathy dimension (Table 6), and also possible elimination of some items was considered, with the aim to increase the internal consistency of the Honesty (Table 7) and Empathy dimensions (Table 8) by means of a correlation between an item and the total score of the scale with the aim to eliminate the item (*Item-total* correlation method).

Statistical analysis of the correlation of items of the weakest dimensions Honesty and Empathy and consideration of possible elimination of some of the items by *item-total*

**Table 4.** Internal Consistency of the Tool MCI and its Dimensions

	$\alpha$
Integrity	0.578
Honesty	0.287
Justice	0.453
Keeping promises	0.560
Responsibility	0.425
Self-control	0.457
Willing to help	0.521
Care for others	0.557
Empathy	0.198
Spirituality	0.458
MCI total score	0.842

**Table 5.** Cross correlations of Honesty items

r	p2	p12	p22
p12	0.131		
p22	0.174	0.139	
p32	0.050	0.138	-0.012

**Table 6.** Cross correlations of Empathy items

r	p9	p19	p29
p19	0.072		
p29	-0.067	0.059	
p39	0.150	0.034	0.099

**Table 7.** Internal consistency of Honesty with possible elimination of one of the items

$\alpha$	AM, if eliminating an item	SD, if eliminating an item	Modified <i>Item-Total</i> correlations	Raised cross-correlations	Cronbach's $\alpha$ if eliminating an item
p2	11.51	2.97	0.190	0.043	0.197
p12	11.25	2.78	0.221	0.049	0.156
p22	12.09	2.34	0.137	0.045	0.254
p32	11.87	2.71	0.075	0.021	0.331

**Table 8.** Internal consistency of Empathy with possible elimination of one of the items

$\alpha$	AM, if eliminating an item	SD, if eliminating an item	Modified <i>Item-Total</i> correlations	Raised cross-correlations	Cronbach's $\alpha$ if eliminating an item
p9	9.28	3.78	0.092	0.034	0.160
p19	9.88	3.37	0.090	0.010	0.168
p29	8.45	4.20	0.050	0.020	0.210
p39	8.49	3.58	0.153	0.035	0.077

correlation did not give expected results. The results indicate that there is almost no correlation among individual items of the Honesty and Empathy dimensions ( $0.012 \leq r \leq 0.174$ ), while some correlations produce even negative values. Elimination of items indicated no obvious increase in the internal consistency of the dimensions examined.

*RQ2: Is it possible to extract 10 factors from the MCI by factor analysis, as claimed by the authors of the inventory?*

The data obtained by the MCI with 40 items were subjected to factor analysis with the aim to find out what the MCI factor structure is like. The factor analysis indicates which inventory items fit in a specific extracted factor and which do not. By means of factor analysis, general characteristics called factors or dimensions are identified, which explain inter-correlations of some variables. First the Kaiser-Mayer-Olkin index (*KMO*) was calculated, showing the level to which it is useful to carry out the factor analysis. In our case, the *KMO* reached the value 0.726, which is a result acceptable in scientific community (it is recommended that the *KMO* should reach the value  $KMO \geq 0.50$ ). Exploratory factor analysis with Varimax rotation method was used (variance maximizing rotation), which minimizes the number of variables highly correlating with dimensions and attempts to obtain a simpler structure of factors allowing them to correlate. Factor loadings with items are presented in Table 9.

The exploratory factor analysis with rotation Varimax enabled to extract 15 factors explaining 66.1% of total variability. The total variability of only 52.3% was obtained in extraction of 10 factors. The basic prerequisite for factor analysis is reduction of redundant information in more correlated variables, if the total variability is over 60%. We also tried to establish factor loadings for each generated factor. Variables with the highest factor loadings for each factor, also called markers, are decisive in interpreting a given factor.

**Table 9.** Factor Structure of the *MC* Questionnaire

Items	Factors														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
p1	.081	.175	-.035	-.209	<b>.466</b>	.276	.099	.111	.316	.062	.124	.333	.153	-.089	-.023
p2	.061	.024	.023	.009	.041	.114	.090	<b>.824</b>	-.043	.078	-.032	.011	-.003	.028	.095
p3	.067	-.040	.149	.144	.037	.112	-.066	.057	.097	-.055	.072	<b>.659</b>	.069	.036	.252
p4	.047	-.053	-.055	.082	-.095	.312	.005	-.045	.125	<b>.600</b>	.176	-.044	.137	-.068	-.092
p5	-.020	.106	.098	.020	.051	<b>.707</b>	.054	.073	.179	-.048	-.001	.141	.022	.024	.192
p6	.105	.032	.044	.001	.098	-.038	.063	.043	.082	.047	-.031	-.085	.080	<b>.830</b>	.131
p7	<b>.609</b>	-.116	.102	.143	.072	.194	.099	-.024	.069	-.010	.189	.096	-.042	.260	-.307
p8	<b>.677</b>	.074	.066	-.082	.044	-.180	.134	.131	-.102	-.069	-.022	-.066	.171	-.093	.030
p9	-.092	.172	-.089	.145	-.139	-.127	.079	-.264	.234	.080	<b>.590</b>	.124	.126	.211	.114
p10	.006	<b>.826</b>	.038	-.052	-.065	.032	.195	.038	.020	-.023	.027	.017	-.011	-.065	.059
p11	.106	.115	.120	.058	.131	.140	<b>.486</b>	.243	.166	.227	.221	.009	.010	-.060	.259
p12	.272	-.039	.169	.245	.129	<b>.371</b>	.209	.030	-.151	.303	-.246	.313	-.141	-.012	-.021
p13	.144	-.042	.062	-.138	.223	.094	.035	.078	-.048	.123	<b>.762</b>	-.030	-.073	-.180	.146
p14	.084	-.075	.160	.401	.076	.122	.045	.067	.319	.241	.086	-.242	.144	-. <b>404</b>	.144
p15	.227	.134	.072	.182	-.032	<b>.513</b>	.262	.222	.134	.077	.138	-.082	.204	-.150	.031
p16	.106	-.100	.023	-.039	.248	.047	<b>.509</b>	.159	.299	.226	-.200	-.210	.088	-.020	.170
p17	.188	.342	.577	.045	.068	.049	-.028	.033	.028	.122	.000	.104	.163	-.041	-.102
p18	.249	.318	<b>.342</b>	.238	.027	-.240	.035	.370	.056	-.025	-.062	.074	-.130	.072	.178
p19	-.050	<b>.793</b>	.088	-.092	.127	.109	-.072	.128	-.019	.020	.064	-.141	.035	.221	-.086
p20	.265	.327	.117	.175	.117	.066	-.077	.087	.066	-.102	-.026	-.514	.089	.227	.241
p21	.247	-.094	.175	.113	<b>.511</b>	.102	.187	.035	.339	-.232	-.082	-.063	.015	.089	.143
p22	.103	.247	.002	<b>.465</b>	.116	-.029	-.129	.386	.272	.045	-.042	-.030	.013	-.026	-.255



Items	Factors														
p23	.039	.042	.074	.314	.000	.169	.273	.355	-.121	-.012	.363	.231	.039	.323	-.147
p24	-.032	-.086	.074	.803	.033	.030	.100	-.036	.037	.166	-.047	.088	-.024	.027	.060
p25	.056	-.057	.113	.051	.073	.156	.113	-.045	.797	.103	.057	.046	.001	.059	.020
p26	-.054	.139	.659	.210	-.105	.006	.368	.024	.039	-.255	.064	-.067	.033	.027	.152
p27	.397	.008	.212	-.011	.035	-.383	.090	.292	.150	-.056	.195	.232	.331	.029	.029
p28	.245	-.010	.585	-.149	.127	-.004	.146	-.067	.030	.312	-.040	.059	-.234	.069	.091
p29	.342	-.033	.649	.128	.096	.115	-.026	.106	.150	.068	.000	.018	.026	.000	-.074
p30	.183	.583	.108	.332	.151	.036	-.070	-.232	-.248	-.097	-.048	-.010	.168	-.170	.119
p31	.043	.146	-.020	.110	.788	-.150	.091	.007	.069	.060	.049	-.003	-.118	.078	.033
p32	-.132	-.196	.388	.011	.509	.245	.020	-.021	-.230	.022	.111	-.051	.264	.063	.073
p33	.085	.091	.135	.465	.437	.225	.152	.185	-.126	-.049	.100	.070	.049	-.016	-.058
p34	.026	.004	.151	.140	.048	-.195	.117	.140	.040	.730	.030	.014	.081	.073	.088
p35	-.027	.065	.057	-.031	-.025	.058	.017	-.030	.067	.133	.033	-.029	.769	.081	.050
p36	.134	.071	.102	.089	.103	.064	.773	-.016	.016	.008	.067	.077	.041	.102	-.122
p37	.626	.131	.154	.104	.095	.007	-.002	-.023	.003	.240	-.152	.037	-.107	.107	.178
p38	.678	-.014	.180	-.030	-.026	.156	.070	.046	.164	.025	.129	.006	.004	.001	.163
p39	.183	.030	.003	.014	.090	.190	.008	.087	.037	.030	.191	.153	.084	.130	.787
p40	.266	.028	-.140	.132	.059	.020	.162	.024	-.180	-.001	-.138	.409	.522	-.064	.043
Variability explained by the factor dimension%	15.46	21.519	26.549	31.021	35.199	39.129	42.765	46.154	49.335	52.351	55.267	58.178	61.036	63.625	66.149

Extraction Method: Principal Component Analysis. Rotation Method: Varimax

## **Discussion and Recommendations**

The problems of moral intelligence are of interest not only for theoreticians but also researchers seeking effective methods for its assessment. The presented study verified psychometric properties of the *Moral Competence Inventory (MCI)* by D. Lennick and F. Kiel, who presented in their book (2008) the concept of moral intelligence consisting of 10 moral competences. They also presented a questionnaire that should enable to identify strong and weak moral competences with the aim to optimize the level of moral intelligence.

However, their book does not present information about or evidence of compilation of the *MCI* or verification of its basic properties, reliability or validity. Considering this fact, we attempted to verify the reliability in terms of test-retest stability and internal consistency of the Slovak version of the *MCI* as well as to verify the factor structure of the *MCI* by statistical analysis aimed at extraction of any and all dimensions or competences. Based on the obtained results, it can be concluded that the reliability, whether the test-retest stability or internal consistency of individual dimensions, reaches the value under 0.60, which is a value unacceptable for professional community. So far the reliability of the *MCI* has been verified only by E. Martin and B. Austin (2008, 2010) on a sample of 171 undergraduate ( $N=153$ ) and graduate ( $N=18$ ) students of business administration disciplines at a western US university. The age of their research sample ranged from 21 to 50, the majority being between 21 and 25 (58%). They verified the reliability of the English version of the *MCI*, as well as the reliability of individual subscales with acceptable alpha values of  $0.66 \leq \alpha \leq 0.84$  (2008). One possible explanation of the low reliability of the Slovak version may be inadequate translation from the English language, as well as the research sample consisting of adolescents compared to the research sample of the foreign authors. Also, it would be useful to verify the reliability on a larger research sample as well as by multiple re-test measuring in our conditions in order to eliminate situational conditionality of answers that could determine its low values. Since this is a self-reporting method, it is difficult to minimize the desirability effect where probands can consciously or unconsciously quickly estimate socially desirable answers. Our probands were at the age when their perception of themselves could still be distorted, while already being aware of expected forms of behaviour for their position in society, which could determine their approach to the questionnaire administration and distort the obtained results. We are of the opinion that a self-reporting method is not suitable for assessment of an individual's moral intelligence.

Also, the factor structure of the *MCI* was verified. 10 factors were extracted, as determined by the authors of the *MCI*, but those explained only 52% of the total variability. Then the questionnaire was subjected to factor analysis with rotation Varimax extracting any and all factors, which were 15. They achieved a sufficient level of variability (over 66%). Acceptable factor loadings over the level of 0.30 were marked. What is, however, a significant shortcoming, is that the 15 extracted factors cannot be unambiguously described, because the loadings of individual factors by variables vary considerably (e.g. factors 8 and 15 were formed only by one item, while factors 1 and 3 were formed by five items), and the factors are loaded on by items that can be interpreted with difficulty (e.g. factor 14 is loaded on by p6, which is “*If someone wants to offend or hurt me, I keep my hair on and don’t show that I am irritated*” and p14: “*I always keep my word*”). We are aware that with insufficiently loaded factors it is not possible to capture the given dimension adequately, and thus recommend another rotation or elimination of items with minimum loadings. E. Martin and B. Austin (2008, 2010) obtained similar results when extracting 8 factors with the total reliability of 65.28%. In our attempt to extract eight factors, variability of only 41.15% was obtained, which is insufficient for explaining the dimensions with the factors obtained.

## **Conclusion**

Based on the first findings about properties of the Slovak version of the *MCI* it can be concluded that it would be useful to re-evaluate compilation of the *MCI* due to the inconsistency of items in individual dimensions, content validity of items with the value of loadings slightly over 0.30, with the aim to reduce and balance the number of items in specific factors, while it would be useful to re-evaluate also the *MCI* dimensions. Subsequently, it is necessary to further verify psychometric properties of the new questionnaire for measuring moral intelligence, so that it can be used for consulting, diagnostic or educational purposes.

We are aware of the fact that the problem of measuring moral intelligence is in its infancy, and that in addition to theoretical analysis, also space should be opened for empirical verification of tools for its possible measuring, which should become a subject of further scientific interest.

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