A COMPARISON OF SELF-ASSESSMENT TENDENCIES OF FULL-TIME AND PART-TIME UNIVERSITY STUDENTS

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Abstract: *Several studies in the existing literature of education research provide empirical evidences that low-achiever higher education students tend to predict and evaluate their own academic performance less accurately than those who perform better in their studies. Former papers have also supported that low-performers generally over-evaluate (both before and after examinations) while high-performers regularly underestimate their performance (or at least they are overestimating to a significantly lower extent). These findings highlight that less good skills and/or abilities are only a part of the low-achievers' handicap. Another serious problem is that they are unaware about these problems (this phenomenon is sometimes referred to as 'Dunning–Krueger effect'). More information on this tendency is useful for both educators and researchers of education, because helping students who are facing this double challenge needs a better understanding of the processes and factors in the background. One of the information still missing from the literature is the results of testing and comparing the self-assessment patterns of students with different background. As a contribution to this area of research we measure the self-assessment differences between full-time and part-time business students. After a brief introduction and a short review of the empirical literature the current paper tests the above mentioned hypotheses on two small samples of full-time (N = 64) and part-time (N = 63) business students from the same course, university and majors. All the students wrote the same test type (multiple choice). Our main results support that in the cases of both the full-time and the part-time students the low-achievers showed a significantly greater mean overestimation. This was true for the pre- and also for the post-examination self-assessment. At the same time, self-assessment accuracy (measured indirectly via the absolute value of the self-assessment error) connected positively to the students' test performance only in the case of part-time students. Moreover, performance and self-assessment accuracy showed a positive linear correlation in case of part-time, a negative linear correlation in the case of full-time students.*

Keywords: self-assessment; part-time students; Dunning–Kruger effect; higher education
JEL classification: I21; I23

1. Introduction

Earlier results in the literature (e.g. Boud and Falchikov, 1989; Dunning and Krueger, 1999, Sundström, 2005; Tejeiro et al., 2012; Karnilowicz, 2012; Kun, 2016) support the existence of the phenomenon that the difference between students' self- and tutors' assessment is not independent of the students' learning performance: high-achievers tend to assess their own performance better than low-achievers. Better performing students are less likely to overestimate themselves; and according to some, but not all of the empirical findings, they are generally more accurate in the estimation of their own performance. This phenomenon is a manifestation of the so called Dunning–Kruger effect. It is a cognitive bias in which the less able tend to over-assess their ability, while the more able tend to underestimate themselves (Dunning and Krueger, 1999).

Former studies about student self- versus tutor-assessment do not provide information about the possible differences in the Dunning–Krueger effect between student groups with different background, except the inspection of the effect school years (i.e. Fitzgerald, White and Gruppen, 2003; Baartman and Ruijs, 2011) or the impact of teaching the students how-to-assess their own performance (i.e. Ross, 2006). The novelty of our paper is that it provides insight into this area of investigation by comparing full-time and part-time-students' self-assessment patterns in the same course and institution. We have three research questions.

The first two questions investigate two aspects of effectiveness in self-assessment: 'direction' and 'accuracy' (Kun 2016a).

Question 1 aims the connection between the students' test performance and the direction of self-assessment errors (over- or underestimation); and is measured via the mean of the signed differences between the self-assessed and the tutor-assessed scores.

Q1: *Is there a significant difference between university students (full-time and part-time) who perform lower or higher on a test in the tendency of overestimating their test scores before and after the examination?*

The second one aims the connection between the students' test performance and the accuracy of self-assessment. The accuracy is measured via the absolute values of the estimation errors.

Q2: *Are the university students with higher test scores more accurate in the self-estimation of the test performance before and after the examinations compared to their fellow students with lower test scores?*

The main contribution of this paper to the empirical literature is finding answer to the third question, because most of the previous studies about student self-assessment in higher education were examined among full-time students.

Q3: *Is there any significant difference between full-time and part-time university students according to the previous research questions? If yes, what are the identifiable differences?*

The following section of our study provides a brief literature review. The Data and method section introduces the database and the research techniques. In the Results section a detailed explanation of the analysis can be found. Based on the outcomes, the Conclusion section describes the implications for the hypotheses and brings notice to the limitations of the findings.

2. A brief literature review

Quantitative empirical studies analysing the difference between student self-assessment and some kind of tutor- (or staff-) assessment are dated back at least to the 1960s. For detailed analysis of the early literature see Falchikov and Boud (1989) or Boud and Falchikov (1989). The research methods and even the compared assessment techniques vary widely, thus detailed comparison is mostly impossible, only general deductions can be made about some factors moderating the effectiveness of self-assessment. The most frequently investigated moderator factor is the gender (Edwards et al. 2003, Macdonald 2004, Boud and Falchikov 1989, Kruger and Dunning 1999, Lynn, Holzer, és O'Neill 2006, Basnet et al. 2012). However, there are many other possible moderators: assessment technique (multiple choice, true or false, oral examination, essay, etc.), culture, experience, area of study, and so on.

There is no consequent support in the literature behind a general tendency among students to overestimate. Neither was it find by Boud and Falchikov (1989) in their review article, nor the newer studies show agreement on it. Some of the supporting studies are Kruger and Dunning (1999), Basnet et al. (2012), Tejeiro et al. (2012), Kun (2016a); while Mehrdad, Bigdeli and Ebrahim (2012) or Kun (2016b) could not identify such general tendency.

The studies agree much more on the positive connection between self-assessment effectiveness and test achievement. Students with higher test scores or with better grades are usually more accurate in the estimation of their own result. Supporting studies are (among others): Boud and Falchikov (1989), Kruger and Dunning (1999), Sundström (2005), Karnilowicz (2012), or Tejeiro et al. (2012). Of course, there are exceptions, too, but the only study known to the authors that does not support the 'high-achievers tend to self-estimate more accurately' hypothesis is the one by Lynn, Holzer and O'Neill (2006). However, the definition of 'accurate estimation' shows a great diversity.

Another phenomenon supported by most of the literature (Boud és Falchikov 1989, Fitzgerald et al. 1997, Kruger és Dunning 1999, Hodges, Regehr, és Martin 2001, Lejk és Wyvill 2001, Edwards et al. 2003, Gramzow et al. 2003, Karnilowicz 2012, Kun 2016a,b) is that high-achievers tend to overestimate their performance less likely and/or with a lower frequency. Sometimes, they even underestimate themselves.

Investigations on the role of gender in self-assessment effectiveness mostly find no statistically significant relationship. However some of them, like Edwards et al. (2003) or Macdonald (2004), found that males tend to overestimate their own performance more than females. On the other hand, Kun (2016a) found just the opposite effect of sex, in a sample of Hungarian university students.

3. Data and Method

The data collection method closely follows the one used by Kun (2016). The data was collected from mid-term examinations among full-time students and from end-term examinations among part-time students. Every students who attended the examinations were asked to participate, and only a very few of them refused. Students were motivated to estimate more accurately via offering them a percentage (+5%) of their total test point to them if they had estimated accurately. The examined course was Research methodology in the Fall semester of 2015 at the University of Debrecen, Hungary, and the students were studying on one of three following master level majors: Management and Leadership, Accountancy, Logistics management. The tutor who created and evaluated the tests was the same in ever examination.

Only the data from the first examination-trial per student are involved (data about re-take examinations are closed out). The structure of the sample by major, sex and full- or part-time status is presented in Table 1.

Table 1: Sample structure

Status	**Sex**	**Major**			
		Management and Leadership	**Accountancy**	**Logistics management**	**Total**
Full-time	Male	8	5	12	25
	Female	14	15	10	39
Part-time	Male	4	6	10	20
	Female	21	12	10	43
Total		47	38	42	127

Source: primary data

When standardized values are used in the following sections, the standardization is done by the groups of students who wrote different tests. The tests contained 15 multiple choice items in the case of full-time students and 40 multiple choice questions in the case of part-time students. When the following analyses do not use standardized values, we employ ratio scores (actual score / maximum score) to even the range of the measurement scales.

In section 4.2. we compare the overestimation tendency and self-estimation accuracy of low-achievers to the same variables of high-achievers. To form these two groups of students, we calculate the terciles of the standardized test scores of the relevant student group (full-time, part-time or all students): the low-achievers are those whose test score is less than or equal to the first tercile, and the high-achievers are those whose test score is higher than or equal to the second tercile.

Based on Kun (2016) we separate the ‘accuracy’ of self-assessment and the ‘direction’ of the self-assessment errors from each other. Accuracy is defined as the absolute value of the difference between the student-assessed and the tutor-assessed test score, while direction is the signed (positive or negative) difference.

4. Results

4.1. Differences between the part-time and the full-time students

First, we present the descriptive data about the test scores (as a ratio of the maximum test scores), self-assessed scores, self-assessment errors, absolute values of the self-assessment errors and the changes in the previously mentioned self-assessment measures (post-test values minus pre-test values) of both the full-time and the part-time students (see Table 2). The table also contains the statistic of the independent samples t-test that compares the means of a given statistic between full- and part-time students.

We can draw the conclusions (based on Table 2) that there are more differences than similarities between full- and part-time students. Where they are not significantly different are the following variables:

- their signed self-estimation errors change (compared to the pre-test assessment) similarly;
- their self-assessment accuracy (i.e. the absolute value of their self-estimation errors) before the test is not significantly different;
- the absolute value of their self-estimation errors change (compared to the pre-test assessment) similarly.

Table 2: Descriptive data (actual score / maximum score ratio) of full-time and part-time students

Measure	Status	N	Mean	SD	t
Pre-exam self-assessment	full	64	0.574	0.119	-4.395***
	part	58	0.658	0.089	
Post-exam self-assessment	full	64	0.536	0.151	-4.231***
	part	61	0.641	0.123	
Tutor-assessment	full	64	0.643	0.137	5.921***
	part	63	0.519	0.096	
Pre-exam self-assessment error	full	64	-0.032	0.173	-5.931***
	part	58	0.133	0.130	
Post-exam self-assessment error	full	64	-0.070	0.134	-7.763***
	part	61	0.119	0.138	
Change (post-exam – pre-exam errors)	full	64	-0.038	0.135	-0.947
	part	56	-0.016	0.109	
Absolute value of pre-exam error	full	64	0.124	0.123	-1.342
	part	58	0.152	0.107	
Absolute value of post-exam error	full	64	0.111	0.101	-2.353**
	part	61	0.153	0.098	
Change (post-exam – pre-exam absolute value of errors)	full	64	-0.013	0.120	-0.766
	part	56	0.002	0.082	

Notes: N is the sample size, SD is the standard deviation, t is the statistic of the independent samples Student's t-test, * $p < 0.100$, ** $p < 0.050$, *** $p < 0.010$.
Source: primary data

4.2. Differences between low achievers and high achievers

In this section we compare the self-assessment measures of low- and high achiever students. Their groups are defined by their standardized test-scores: if it is lower than or equal to the first tercile (in the relevant group: full-time or part-time) they are considered to be low-achievers, and those with a standardized test score higher than or equal to the second tercile are considered to be high-achievers. In Table 3a we present the descriptive data and the independent samples t-statistics of high- and low-achievers within the full-time student group, while Table 3b contains the same data about part-time students.

Table 3a: Low-achiever vs. high achiever full-time students (standardised scores)

Measure	A	N	Mean	SD	t
Pre-exam self-assessment error	low	22	0,770	0,662	6,384***
	high	31	-0,588	0,887	
Post-exam self-assessment error	low	22	0,436	0,944	2,731***
	high	31	-0,291	0,963	
Change (post-exam – pre-exam errors)	low	22	-0,473	0,910	-3,407***
	high	31	0,403	0,931	
Absolute value of pre-exam error	low	22	-0,194	0,871	-1,367
	high	31	0,203	1,145	
Absolute value of post-exam error	low	22	-0,175	0,821	-1,165
	high	31	0,146	1,094	
Change (post-exam – pre-exam absolute value of errors)	low	22	0,122	1,108	0,901
	high	31	-0,132	0,939	

Notes: A is the achievement group, N is the sample size, SD is the standard deviation, t is the statistic of the independent samples Student's t-test, * p < 0.100, ** p < 0.050, *** p < 0.010.
Source: primary data

Table 3b: Low- vs. high achiever part-time students (standardised scores)

Measure	A	N	Mean	SD	t
Pre-exam self- assessment error	low	22	0,740	0,866	5,949***
	high	22	-0,639	0,657	
Post-exam self-assessment error	low	22	0,588	0,964	4,004***
	high	22	-0,466	0,769	
Change (post-exam – pre-exam errors)	low	20	-0,094	0,973	-0,953
	high	22	0,189	0,950	
Absolute value of pre-exam error	low	22	0,723	1,054	5,557***
	high	22	-0,678	0,538	
Absolute value of post-exam error	low	22	0,687	0,956	5,022***
	high	22	-0,545	0,641	
Change (post-exam – pre-exam absolute value of errors)	low	20	-0,067	1,029	-1,075
	high	22	0,227	0,729	

Notes: A is the achievement group, N is the sample size, SD is the standard deviation, t is the statistic of the independent samples Student's t-test, * p < 0.100, ** p < 0.050, *** p < 0.010.
Source: primary data

If one compares the results of Table 3a and 3b interesting differences can be revealed. In the groups of both full- and part-time students the low achievers tend to significantly overestimate their test scores both before and after the examinations, but the similarity stops here. While full-time students tend to modify the estimation of their performance after the examination their part-time fellows do not. At the same time, high achievers tend to be significantly more accurate in their estimations than low achievers only if we examine the part-time students. The full time students' self-estimation accuracy seems not to be connected to their test performance: the better performing students make errors of the same size as the worse performers, only the direction of the errors differs.

4.3. Correlations between test scores and self-assessment measures

Via linear correlation analysis we investigated the linear connections between the change (increase or decrease) of the (standardized) test score (the tutor's assessment) and nine different measures of the students' self-assessment. The results are presented in Table 4.

Table 4: Linear correlations between the standardized tutor assessment and various standardized measures of self-assessment

Measure		Student groups		
		Full-time	Part-time	Total
Pre-exam self-assessed score	ρ	0.188	-0.016	0.091
	N	64	58	122
Post-exam self-assessed score	ρ	0.503***	0.224*	0.361***
	N	64	61	125
Post-pre change of self- assessed score	ρ	0.410***	0.202	0.313***
	N	64	56	120
Pre-exam self-assessment error	ρ	-0.664***	-0.733***	-0.697***
	N	64	58	122
Post-exam self-assessment error	ρ	-0.390***	-0.495***	-0.441***
	N	64	61	125
Post-pre change of the error	ρ	0.410***	0.202	0.313***
	N	64	56	120
Absolute value of pre-exam self-assessment error	ρ	0.257**	-0.705***	-0.202**
	N	64	58	122
Absolute value of post-exam self-assessment error	ρ	0.213*	-0.542***	-0.160*
	N	64	61	125
Post-pre change of the absolute value of error	ρ	-0.124	0.199	0.027
	N	64	56	120

Notes: ρ is the Pearson correlation coefficient, N is the sample size, * $p < 0.100$, ** $p < 0.050$, *** $p < 0.010$.
Source: primary data

Table 4 reveals interesting differences between the full-time and the part-time students:

- full-time students show stronger and more significant correlation between real and after-examination self-assessed test scores;

- full-time students show a positive, weak-medium linear correlation between test performance and the difference between post- and pre-examination self-assessment, while no significant relationship can be identified in the case of part-time students;
- full-time students also show a positive, weak-medium linear correlation between test performance and the difference between post- and pre-examination self-estimation errors, while no significant relationship can be identified in the case of part-time students;
- full-time students seem to significantly predict their performance less accurately (the linear correlation is weak) if their tutor-assessed test results are better, while part-time students are significantly more accurate (strong linear correlation) if their test scores are higher;
- full-time students show no significant correlation between test scores and post-test self-estimation accuracy at the 5% significance level, while part-time students show a medium negative linear correlation between the absolute value of errors and the test scores.

5. Conclusions

Based on the results presented in the previous section we can answer our three research questions as follows.

Q1: Is there a significant difference between university students (full-time and part-time) who perform lower or higher on a test in the tendency of overestimating their test scores before and after the examination?

Yes, there is. This was supported with independent samples t-tests and also with linear correlation analysis within both examined student groups (full- and part-time).

Q2: Are the university students with higher test scores more accurate in the self-estimation of the test performance before and after the examinations compared to their fellow students with lower test scores?

In the case of full time students, we found no significant connection between test performance and self-estimation accuracy via independent t-tests; but the linear correlation analysis revealed a weak negative correlation between performance and accuracy. The part time students provided just the opposite results. In their case, better achieving students tend to estimate their own test scores (both before and after the test) significantly more accurately. This was supported both via t-test and linear correlation analysis.

Q3: Is there any significant difference between full-time and part-time university students according to the previous research questions? If yes, what are the identifiable differences?

The connection between the students' test performance and their self-assessment accuracy showed an interesting difference between the two types of students. High-achievers seem to be more accurate than low-achievers only if we examine part-time students. In the case of full-time students there is no such connection according to the results of the t-test; while there is only a week linear correlation that's direction is just the opposite than in the part-time students' case.

Evaluating or results one must take into consideration that we examined only a small sample of students from one university only, thus the generalizability of our findings is relatively weak.

This paper is a part of a series of studies investigating student self-assessment at the University of Debrecen (Boros et al., 2016; Kun, 2016a,b; Máté and Kiss, 2016; Máté et al., 2016; Szabolcsi, 2016). These studies are following the same methodology described by Kun (2016a), thus they measure both pre- and post-test self-assessment, and identify accuracy and overestimation tendency separately. A future research aim is to meta-analyse the data collected during the individual researches to reveal the possible differences among courses, majors, test techniques, or even student groups with different demographic background.

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