Creativity Assessment in School: Reflection from a Middle School Italian Study on Giftedness

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Abstract The attention to Gifted students is a growing educational topic in Italy. This work is part of a broader doctoral study on giftedness assessment and education. In particular the contribute explores the usefulness of a teacher's instrument to test creativity in Italian lower secondary schools. For this purpose it was tested the concurrent validity of the Renzulli Subscale of Creativity [1] used by mainstream teachers and special educational needs teachers and the William Test of Divergent thinking [2] used by the Educational researcher and completed by the students. A total of 106 students and 9 teachers participated in the study. The quantitative analysis shows a positive correlation between the evaluations through the Williams test and the Renzulli Subscale of Creativity used by the whole group of teachers. Therefore, the study checked if there was a difference between teachers' characteristics in the evaluation of creativity, in particular between mainstream and special educational needs teachers. The results show that there is no statistical difference between the evaluations of the group of teachers. A reflection of the importance of a multidimensional approach on the study of creativity, and in general of giftedness, that considers multiple source of information in the identification and Education of Gifted students is carried out in the study.

Keywords Giftedness, Creativity, Middle School, Multidimensional, Identification

1. Introduction

Alongside the new conceptualization of the construct of giftedness, there is an emerging demand for a new paradigm for its identification [3] that "would recognize the different ways in which students display giftedness and would call for more varied and authentic assessment" [4;p.3].

In the "Three Rings model" of Renzulli [5], creativity represents one of the main components of Giftedness. According to Renzulli, highly creative productive as opposed to lesson learning giftedness is really a combination of an inner action between and among commitments, high ability and creativity.

Creative productive people have above average but not necessary superior level of ability as measured by tests of intelligence and aptitude [6]. Well-above-average ability can be considered as either a general ability that interferes in all domains and/or specific ability related to high level performances within specific domains. Renzulli defines well-above-average ability as that possessed by those individuals performing in the top 15–20% of any domain.

Creativity represents a key element in the definition of giftedness and its assessment is crucial for the valorisation of the child's potential [7]. Being able to assess divergent thinking in students is the first step to meet their needs. Not taking any measure to identify the potential, in conjunction with specific deficit or disadvantaged situations, is a risk that today's educational systems can no longer run, because this would mean not being able to guarantee what students actually need to grow as a full person. For this purpose a multi-dimensional approach to the assessment of children's potential could guarantee a better understanding of their learning process. This means having different information from different instruments in order to create a complete picture of the child.

As mentioned before, Renzulli is credited with having proposed the dichotomy between school-house giftedness and creative-productive giftedness (manifested by high-level performance and innovative ideas). "Creativity is the interaction among aptitude, process, and environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context." [8]. Schoolhouse giftedness refers to high-test school scores and creative productive giftedness is connected with recognized high-level performance in specific areas and the creation of innovative ideas. This alternative conception of giftedness and simultaneously of gifted education, takes in

consideration for the first time psychological characteristics such as task persistence, creativity, motivation, and bring them at the same level of intellectual or academic abilities. According to the Author, school programs should search for these competences and cultivate them through specific interventions. Thanks to the contribute of Renzulli to the understanding of giftedness, the educational and psychological debate on the definition of the construct started to focus on the contributions of psychosocial variables to the manifestation of giftedness [9].

Gifted identification is based primarily on measures of intelligence. In an american study of 2012 of McClain and Pfeiffer [10] it results that few states included creativity in the definition of giftedness. According to this perspective, the literature indicates other equally important components in the construction of the concept of Giftedness like creativity and task commitment [5]. Along the doctoral thesis, according to the Renzulli Model of Giftedness we wanted to test intelligence with dynamic measures [11-13] and creativity with two different instruments, one already standardized and another adapted to the Italian context.

2. Objectives

The assessment of Creativity among teachers rating scales and the Test of Creativity is the aim of the research. In particular, we wanted to test the concurrent validity of the Renzulli Subscale of Creativity used by teachers and the William Test of Divergent thinking used by the Educational researcher and completed by the students.

3. Materials and Methods

3.1. Samples

The collected data derives from a voluntary sample survey. School who answered to our request of data were selected for this study. The sample was composed by 106 students (55 Males and 51 Females), of five different classrooms (4 classroom of first year of middle school and one of the second year), which were evaluated from the Educational researcher through the Williams Test of Creativity [2]. 111 assessments were made by 6 mainstream teachers and 56 assessments were made by 3 SEN (special educational needs) teachers through the Renzulli Subscale of Creativity [1] for a total of 167 assessments. 7 teachers were females and two were males.

First, after a 6 hours training on Giftedness, teachers were invited to fill the Scales for Rating the Behavioural Characteristics of Superior Students for each student of their classroom. Secondly, the Test of Creativity and divergent thinking classroom students was administered in the classroom.

3.2. Instruments

3.2.1. The Creativity Subscale of the Scales for Rating the Behavioural Characteristics of Superior Students

The Italian translation of the Renzulli-Hartman *Scalesfor Rating the Behavioural Characteristics of Superior Students* [1]was used for this procedure. These rating scales "are not used to eliminate students with lower ratings [but] to provide a composite profile of the nominated students" [14;p.60]. The first four scales in the list (Learning, Creativity, Motivation, and Leadership) are generally worldwide used during the identification process of gifted students and are "consistent with the objectives of most gifted education programs and services." [1; p.28). The learning, motivation and creativity scales are based on the Three-Ring Conception of Giftedness (Renzulli, 1978). The SRBCSS-III is a 6-points response scale (1=never, 2=very rarely, 3=rarely, 4=occasionally, 5=frequently, 6=always). "Unlike normed instruments such as standardized tests, which compare students across the entire population, SRBCSS-R is purposefully designed to access student strategies within a local reference group. Furthermore, regardless of the demographic characteristics of a school district, the students who receive the highest ratings on the scales are the students who need services above and beyond the curriculum provided for a majority of the students within each setting" [1]. The individual scales assess different traits, characteristics and domains, so it is recommended to avoid summing the scores across scales because the teacher or the user of the scale can lose important information about specific strengths of the students [15].

In a previous study [16] the scales were used to calculate the Italian cut off scores. For the purpose of this study we will consider only the points achieved by the students in the Creativity Subscale. Intended as divergent thinking, the creativity is assessed through 9 items focused to explore the risk taking behaviour of the students, their non-conformist attitude and their original and fluent thinking.

3.2.2. The Test of Creativity and Divergent Thinking [2]

The Test of Creativity and divergent thinking comprehends three different instruments: the Test of Divergent Thinking, the test of creative Personality and the Williams Scale for teachers and parents. It is based on the Williams model of Creativity. In this specific study we used the Italian version of the Test of Divergent Thinking that assesses four cognitive factors of the creative thinking [2; p.13].

The test of Divergent Thinking is composed by 12 frames with incomplete graphic stimuli where children have to draw a picture. It evaluates creative performance along five indicators: fluency, flexibility, originality, elaboration and production of titles. The fluency score corresponds to the amount of pictures created by

participants (range 1-12 points). The flexibility score indicates the number of changes of ideas from one category to a different one, for example from the category living being to the category symbols (range 1-11 points). The originality score corresponds to the total number of pictures that the student draws inside or outside an incomplete stimulus (for example a line or a curve) of the frames (range 1-36 points). If the picture is drawn outside the stimuli the student gets 1 point, if picture is drawn inside the stimuli the student gets 2 points, and 3 points if the students draw the picture both inside and outside the incomplete stimuli. The elaboration score refers to the number of asymmetric pictures drawn by children (range 1-36 points). Symmetrical pictures gives zero points, asymmetric pictures drawn outside the incomplete stimuli lead to one point, the asymmetric pictures inside the incomplete stimuli lead to 2 points, and asymmetric pictures drawn both inside and outside the stimuli lead to 3 points. As regard the production of titles (range 1-36 points), in each picture one point was assigned for simple titles, 2 points for titles including descriptive adjectives, 3 points for imaginative and creative titles indicating something beyond the picture drawn by participants.

3.3. Research Design

Preliminary analyses included testing of normality, homogeneity of variance–covariance matrices, and presence of outliers. In order to check for the normality of the variables the Shapiro-Wilk test was used.

4. Results

When we look at the Williams TWG (scores of all the students on the Williams test), the Shapiro Wilk test (table 1) is .01 which is less than .05. Therefore, we would reject the null hypothesis and we would presume that there is a statistically significant difference between the Williams distribution and the normal distribution and consequently presume that the WGT scores are not normally distributed.

While focusing at the Renzulli WGFS the Shapiro Wilk test it is .06 which is greater than .05. This result means that we would fail to reject the null hypothesis or accept the null hypothesis (there is not statistically significant difference between the "Renzulli WGFS" and a normal distribution), consequently we would presume that these scores are normally distributed. According to the results, as the assumptions of Pearson's Bivariate Correlation (multivariate normal distribution of the variables to test for significance) is not met, only Speaman's Rho Correlation Analysis can be used in this case.

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Table 1. Tests of Normality of the Williams and Renzulli Subscale data distributions

Test	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	Df	Sig.
Williams TWG	,078	165	,017	,978	165	,010
Renzulli WGFS	,059	165	,200(*)	,985	165	,067

* This is a lower bound of the true significance

a Lilliefors Significance Correction

Table 2. Correlation between Williams and Renzulli Scales in the evaluation of teachers (Mainstream & Sen)

			Williams	Renzulli Creativity Subscale
Spearman's Rho	Williams	Correlation Coefficient	1,000	340(**)
		Sig. (2-tailed)		,000
		N	165	165
	Renzulli	Correlation Coefficient	,340(**)	1,000
		Sig. (2-tailed)	,000	.
		N	165	165

** Correlation is significant at the 0.01 level (2-tailed)

The analysis of the correlations shows a weak uphill (positive) linear relationship between the evaluations through the Williams test and the Renzulli Subscale of Creativity (table 2), therefore we wanted to check if there was a difference between teachers' characteristics in the evaluation of creativity. To verify that, the whole group of teachers was split into two different groups: MT (mainstream teachers) and ST (SEN teachers) evaluations. We conducted a new test of Normality for each subgroup showing that the distribution of the mainstream teachers evaluation (Renzulli MT) was normally distributed (sig. .051), while the subgroup of data of the Williams scale -that we wanted to correlate - were not normally distributed (sig. .008). The subgroup of evaluations made by the researcher using William's test (sig. .895) and by the SEN teachers using the creativity subscale of Renzulli (.480) followed a Gaussian distribution.

For the measure of the strength of the association between the two variables it was conducted a Rho Spearman analysis between the mainstream teachers and the researcher evaluations (Table 3) and a Pearson Correlation Analysis between the SEN teachers and the researcher (ER) evaluations (Table 4).

The Rho Spearman Analysis between the SEN teachers and the researcher evaluations, showed the same results (table 5). As indicated in tables 3 and 5, the tests for agreement between the two scales showed moderate correlations (Spearman's rho ranged from .330 to .398) but the correlation is higher when only the SEN Teachers' evaluations are considered. Using the Fisher r-to-z transformation a value of z was calculated in order to assess the significance of the difference between the two correlation coefficients. The z value was -0.05 for p=.96 (two tailed) which means that there is not a statistically difference between the two correlation coefficients.

Table 3. Correlation between Williams Test used by the Educational researcher and Renzulli Test used by the Mainstream teachers

			Williams	Renzulli MT Creativity-Subscale
Spearman's Rho	Williams (ER)	Correlation Coefficient	1,000	,330(**)
		Sig. (2-tailed)	.	,000
		N	111	111
	Renzulli MT	Correlation Coefficient	,330(**)	1,000
		Sig. (2-tailed)	,000	.
		N	111	111

** Correlation is significant at the 0.01 level (2-tailed).

Table 4. Correlation between Williams Test used by the Educational researcher and Renzulli Test used by the SEN teachers

		Williams	Renzulli ST
Williams (ER)	Pearson Correlation	1	,338(*)
	Sig. (2-tailed)		,012
	N	54	54
Renzulli ST	Pearson Correlation	,338(*)	1
	Sig. (2-tailed)	,012	
	N	54	54

*Correlation is significant at the 0.05 level (2-tailed).

Table 5. Correlation between Williams Test and Renzulli Test used by the SEN teachers

			Williams1	Renzulli ST
Spearman's Rho	Williams1	Correlation Coefficient	1,000	,398(*)
		Sig. (2-tailed)	.	,010
		N	54	54
	Renzulli ST	Correlation Coefficient	,398(*)	1,000
		Sig. (2-tailed)	,010	.
		N	54	54

*Correlation is significant at the 0,05 level (2-tailed).

Table 6. Scores in the Williams test and on the Renzulli Creativity Subscale of the students with high scores. Scores above the critical threshold are highlighted**.**

		WILLIAMS	Renzulli/ Creativity
	Teachers		
S.1	ST	114	0,60334
S.1	MT	114	0,0467
S.2	ST	100	1,24579
S.2	MT	100	0,52837
S.3	ST	93	2,29097
S.4	MT	104	-1,7344
S.4	MT	104	-0,35733
S.5	MT	109	0,03584
S.5	MT	109	0,35947
S.6	MT	76	2,29231
S.7	MT	99	1,08582
S.7	MT	99	1,33336
S.8	ST	86	2,04844

Although SEN teachers' evaluations showed a slightly greater correlation with a test of creativity of Williams in 5 cases children with high creative potential were not identified by teachers through the Renzulli Hartman Rating Scale, in two cases by SEN teachers and in 5 cases by mainstream teachers (see table 6). If we look at table 6, subject 4 who had a very high point on Williams Creativity Test, according to two different mainstream teachers is at -1.7344 and -0.35733 standard deviations in the Subscale of Creativity. On the other hand in three cases subjects 3,6 and 8 children identified by teachers through the Renzulli Subscale of Creativity did not have a performance above the threshold values in the Williams Test.

Although there is not a statistical difference between these two correlation values, a qualitative analysis of the data and the field-notes of the "day-by-day talks" with teachers showed that in two cases, for two children, SEN teachers and the researcher's evaluations were similar. In particular, SEN teachers stated that two students exhibit specific creative behavior and superior thinking, which was confirmed in the evaluation of the Williams test of Creativity conducted by the researcher.

5. Discussion

The assessment made by the researcher offered the opportunity to discuss with teachers the reasons why some students with low scores in Teachers Rating Scales, had high points on the tests of Intellectual Potential (TIP) [17] (this test was used for the identification of Gifted Students in the broader doctoral study) and the Williams test of Creativity.

As indicated to the teachers during the training and the

meeting at school, there are different profiles of gifted students [18]. Students with high scores in the teachers rating scale, the TIP and the Creativity test, correspond to the profile "Successful" which are usually easily identified by teachers and placed in gifted programme.

The students of the explored classroom, identified only with the TIP and Creativity tests seemed to correspond to the gifted profiles described by Betts and Neihart [19]. In particular they reflected the type IV "dropout" and type II "challenging" profiles of gifted student, and the Double-Exceptional whose potential was identified only by the SEN teacher and the Educational researcher and in some cases only by the Educational researcher. Dropouts "have interests that lie outside the realm of the regular school curriculum and fail to receive support and affirmation for their talent and interest in these unusual areas." [20; p.101]. Some children have difficulties to be identified by teachers because they often question teachers and have bad behaviours that affect the student-teacher relationship.

As regards the Creativity assessment, the moderate correlation between the two tests and qualitative analysis shows that in many case children with a high creative potential do not express, or maybe do not have the opportunity to express their potential during daily school activities.

We have seen that in five cases children with high creative potential were not identified by teachers through the Renzulli Hartman Rating and three children identified by teachers through the Renzulli Subscale of Creativity did not have a performance above the threshold values in the Williams Test. This data, although not statistically significant, must be carefully considered because it refers to two people who risk of being transparent and

under-considered despite a high-quality cognitive profile confirming the need of multiple source of information for the identification of gifted students.

6. Conclusions

Giftedness is a multidimensional construct and its identification is not a linear and univocally defined process. At the same time the assessment of Creativity, one of the core component of Giftedness, intended as divergent thinking, presents many measurement-related challenges[20].

When we talk about creativity and giftedness in general we do not have to think with exclusion criteria but we have to think in a "formative/dynamic way" so as not to run the risk to underestimate children' potential just because they do not obtain a certain score in a certain scale. This means that those involved in education and promotion of the development and growth of new generations need information of different aspects of the child and with different tools, through a plurality of approaches and observation points.

School information, familiar information and child observations in classroom should be considered together, and each information has the same "dignity" to be considered in a democratic evaluations of the students because they capture aspects of the child in different contexts and situations and, above all else, its inner potential.

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