“Obvio!” – There are More Questions than Answers in the Early Identification of Children with Academic Talent – A Perspective from PENTA UC Escolar, Chile


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Abstract

PENTA UC Escolar is an extracurricular, intra-school enrichment educational program designed for children from first to fourth grade. It consists of a System for identification and selection, Curriculums in language and mathematics, and a Model for program management. Theoretically, it is based on Sternberg’s Triarchic theory of intelligence and states that the outstanding intellectual performance results from the joint use of three types of abilities – analytical, practical and creative. Correspondingly, three instruments are applied to measure the abilities in question and to identify students with academic talent. The sample in the present study consists of 5041 children, 519 of which were identified as gifted. Results demonstrated that among talented children, there is generally a negative relationship between creative, analytical and practical abilities. Girls demonstrated higher practical abilities among students in all age groups who were not identified as talented. Boys performed better than girls in tasks for analytical abilities, in the group of talented children, only among older ones.

Keywords: Chile; identification; academic talent; PENTA UC Escolar; Triarchic Theory of Intelligence; extracurricular activities.

The early identification of talented children

The importance of early identification is well recognized from the experts in the field of gifted education. Childhood as a developmental period is the most important stage for maximizing the potential of the gifted (Huang, 2008) and “preschool and primary years represent a critical period of time in terms of both cognitive and psychosocial development” (Hollinger and Kosek, 1985, p.168).

In a recent review on the theoretical and research achievements in intelligence, Nisbett et al. suggest that “measuring nonanalytic aspects of intelligence could significantly improve the predictive power of intelligence tests (Nisbett et al., 2012, p. 131). In the case of economically disadvantaged talented children who are often underrepresented in the programs for gifted students, the use of multiple criteria approach (non-verbal tests, dynamic assessment, portfolios) in addition to the traditional standardized tests would definitely improve their identification (VanTassel-Baska, Feng and Evans, 2007). Not less important is that returns to early investment in children from disadvantaged environments is higher compared with the returns to late childhood investment and remediation at later age - “later remediation of early skill deficits can be costly” (Cunha, 2006, p.58). The first years of the basic
education establish children’s relationship with the educational institution and it is vital not to “uproot” them from the regular classroom. That is why PENTA UC Escolar (Arancibia, 2005) was created. As an attempt to propose educational intervention for younger children, PENTA UC Escolar is an extracurricular, intra-school enrichment program designed for children from first to fourth grade. It consists of identification and selection system, language and mathematics curriculums, and a program management model. In 2009 the PENTA UC Escolar was acknowledged as the best innovative educational project in Chile. Its’ goal is to bring talent education into the regular classroom and to offer challenging early enrichment opportunities to talented children who have not received such attention before. Theoretically, PENTA UC Escolar is based on Sternberg’s Triarchic theory of intelligence (Sternberg, 1985; Sternberg, 1999; Sternberg & Clinkenbeard, 1995; Sternberg et al., 1996). This is a “multifactorial model of giftedness” (Heller, 2003) which states that the outstanding intellectual performance results from the joint use of three types of abilities – analytical, creative and practical. Talent is based on being able to coordinate these three abilities and know when to use each of them. Analytical abilities are involved in the processes of learning, comparing, analyzing, evaluating and judging. They correspond with the formal logical thinking and are usually measured with the standardized tests of intelligence. Creative abilities are related to the invention of a novel object or idea. They take part when usual situations are interpreted in a nontraditional, original way. Practical abilities are related to the “tacit knowledge”. They are those by which the person selects, modifies or transforms the environment in order to fulfill his/her goals (Sternberg et al., 2006). PENTA UC Escolar program employs these three dimensions as an understanding on intelligence and incorporates them in the identification process (Preiss, D. et al., 2010), curriculums in language and mathematics and teacher training.

Method

Three tests were elaborated in order to measure the analytical, creative and practical abilities of the children. The test for analytical abilities is based on the Berlin’s Intelligence Structure Model (BIS), which represents general intelligence as 12 facets of intellectual abilities. (Jäger, 1982 in Bucik and Neubauer, 1996). It was standardized from Rosas (1996) and later adapted for the purposes of the Program (Preiss, D. et al., 2010a). Practical intelligence is measured by means of “if-then” situations related to the everyday social life of the children at school and at home. The instrument was especially designed for the program (Preiss, D. et al., 2010b). The creativity test was also designed at PENTA UC on the basis of similar tests, applied by the PACE Center of Tufts University (Preiss, D. et al., 2010c). The main goal of the present study was to explore analytical, practical and creative abilities of children who were identified and not identified as talented. As recent studies demonstrated that the relationship between intelligence and creativity is negligible (Kim, 2005), it was also aimed to reveal what is the relationships between the three abilities. Attention to gender differences was also given.

Results

The sample consisted of 5041 children. A total of 519 children (223 boys and 296 girls) were identified as gifted. There were 231 students from first and second grade and 288 from third and fourth. Students’ scores in the three questionnaires were standardized and a total score was computed. Identified as talented were those children who were in the 90th or higher percentile in their z-score. A series of correlational analyses was conducted for both age groups, and separately for boys and girls. Tables 1 and 2 present the results for students not identified as talented and tables 3 and 4 for their talented counterparts.
Intercorrelations for boys who were not identified as talented are presented above the diagonal (N=866), and intercorrelations for girls who were not identified as talented are presented below the diagonal (N=847). Means and standard deviations for the boys presented in the vertical columns, and means and standard deviations for the girls are presented in the horizontal rows.

It can be observed from Table 1 and 2 that among students who were not identified as talented, both genders from first and second grade demonstrated positive moderate correlation between analytical and practical abilities. Among older students practical abilities correlated weakly in positive direction with creativity. Only girls from first and second grade showed positive relationship between analytical and creative abilities, but the magnitude was negligible. Only boys from third and fourth grade displayed weak positive correlation between analytical and practical skills. A strike difference in the relationship between the three types of abilities was reviled when only talented children were studied (Table 3 and 4).

### Table 1: Summary of intercorrelations, means and standard deviations for scores on analytical, creative and practical abilities at first and second grade level for boys and girls who were not identified as talented.

<table>
<thead>
<tr>
<th>Abilities</th>
<th>Analytical</th>
<th>Practical</th>
<th>Creative</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical</td>
<td>___</td>
<td>0.351**</td>
<td>0.041</td>
<td>-0.129</td>
<td>1.017</td>
</tr>
<tr>
<td>Practical</td>
<td>0.366***</td>
<td>___</td>
<td>-0.005</td>
<td>-0.218</td>
<td>1.006</td>
</tr>
<tr>
<td>Creative</td>
<td>0.098**</td>
<td>-0.005</td>
<td>___</td>
<td>-0.150</td>
<td>0.888</td>
</tr>
</tbody>
</table>

Mean: 0.117 SD: 0.924 for boys, Mean: -0.021 SD: 0.929 for girls.

*P ≤ .05; **P ≤ .01; ***P ≤ .001

Intercorrelations for boys who were identified as talented are presented above the diagonal (N=110), and intercorrelations for girls who were identified as talented are presented below the diagonal (N=121). Means and standard deviations for the boys are presented in the vertical columns, and means and standard deviations for the girls are presented in the horizontal rows.

### Table 3: Summary of intercorrelations, means and standard deviations for scores on analytical, creative and practical abilities at first and second grade level for boys and girls who were identified as talented.

<table>
<thead>
<tr>
<th>Abilities</th>
<th>Analytical</th>
<th>Practical</th>
<th>Creative</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical</td>
<td>___</td>
<td>-0.118</td>
<td>-0.135</td>
<td>0.907</td>
<td>0.720</td>
</tr>
<tr>
<td>Practical</td>
<td>0.064</td>
<td>___</td>
<td>-0.393***</td>
<td>0.834</td>
<td>0.743</td>
</tr>
<tr>
<td>Creative</td>
<td>-0.179*</td>
<td>-0.325***</td>
<td>___</td>
<td>1.486</td>
<td>1.106</td>
</tr>
</tbody>
</table>

Mean: 0.907 SD: 0.722 for boys, Mean: 0.931 SD: 0.735 for girls.

*P ≤ .05; **P ≤ .01; ***P ≤ .001

Intercorrelations for boys who were identified as talented are presented above the diagonal (N=110), and intercorrelations for girls who were identified as talented are presented below the diagonal (N=121). Means and standard deviations for the boys are presented in the vertical columns, and means and standard deviations for the girls are presented in the horizontal rows.
Intercorrelations for boys who were identified as talented are presented above the diagonal (N=112), and intercorrelations for girls who were identified as talented are presented below the diagonal (N=174). Means and standard deviations for the boys are presented in the vertical columns, and means and standard deviations for the girls are presented in the horizontal rows.

Creative abilities of both boys and girls with academic talent from all age groups were moderately correlated to practical abilities but in negative direction (such relationship existed among not talented students, but with positive magnitude and only for first and second grade). Most interestingly, between analytical abilities and creativity we revealed a strong negative correlation among talented boys from third and fourth grade. Such type of relationship but with weak and moderate magnitude was also discovered among talented girls in all age groups.

Next, gender differences were explored separately for analytical, creative and practical skills. Children were divided in two groups – identified and not identified as talented. Among the group of not identified as talented first and second grade children, girls (M = -0.021; SD = .929) demonstrated significantly higher practical abilities compared with boys (M = -0.218; SD = 1.00); (t(1711) = -4.222; p = .000; Cohen’s d = -0.20). In older children (third and fourth grade) girls also (M = -0.027; SD = .976) showed higher practical abilities compared with boys (M = -0.231; SD = .962); t(1795) = -4.447; p = .000; Cohen’s d = -0.21. In the group of talented students there were no significant differences in any of the studied abilities among first and second graders. Third and fourth grade boys (M =1.121; SD=.841) showed significantly higher analytical abilities compared with girls (M = 0.878; SD =.659); t(226.3) = 3.876; p =.000; Cohen’s d = 0.52.

Discussion

Results regarding the relationship between students’ abilities were intriguing. It was demonstrated that among children who were not identified as talented there is generally a low to moderate positive correlation between some of the abilities. What was interesting is that all significant correlations in the group of talented children were negative (moreover strong negative in the case of analytical abilities and creativity of talented boys from third and fourth grade). This suggests that cognitive abilities of talented students are developed in different degrees and that being highly creative, for example does not mean being excellent in analytical skills. The significance of this result is evident in the light of talent identification at early age. It seems that analytical and creative abilities not only do not correlate positively, but moreover they are negatively related among talented children. Considering gender differences, it was shown from the results that girls not identified as talented have higher practical abilities in both age groups.
There are two potential perspectives that may be extrapolated. The test of practical intelligence comprises mainly situations from school life and home, and girls are usually conducting themselves better than boys in these contexts. Moreover, in Chile it is expected from women to “manage” the household and it could be speculated that practical abilities are encouraged in girls at young age so that they would be successful in life. Our results suggested that only at older age boys outperform girls in analytical abilities, but since the BIS model is an hierarchical model of intelligence (comprising four types of cognitive operations and three types of content where the operations are performed), it is not clear in which facets of intellectual abilities this is presented. In summary, our results suggest at least two fascinating directions for further research. First, it is necessary to explore in details the relationship between creativity and analytical abilities among talented children. Second, although gender differences in analytical abilities are generally well documented, there is still not enough information in which concrete aspects (or facets) boys perform better than girls or/and whether there are facets of analytical skills in which girls demonstrate better results. The knowledge about those relationships and gender differences would not only facilitate the identification process, but also would help teachers to build more effective techniques and methodologies toward young students with academic talent.

References

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