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The Center for Talented Youth Identification Model: A Review of the Literature

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Abstract: This paper reviews the literature on the Talent Search identification model that was developed by Julian Stanley as the Study of Mathematically Precocious Youth at Johns Hopkins in the 1970s and implemented by the Center for Talented Youth from the early 1980s through to the present. Other universities in the United States have also adopted this model for talent identification and development, and it has been adapted for use in other countries. To date, more than 3.5 million students have participated in Talent Search assessments, and hundreds of thousands of students have enrolled in specialized academic programs for able learners. Here we analyze the model's founding principles, its universal characteristics, and its application and functioning in Spain. We conclude with some reflections about what we have learned and what could be done worldwide.

Keywords:

SMPY, Talent Search concept, CTY, Johns Hopkins, Talent Identification, Talented Youth, CTY Spain

In recent years, we have witnessed a significant evolution in the focus and conceptualisation of high ability as new initiatives have arisen that attempt to combine high ability, talent, creativity, innovation and excellence; organisations have been founded concerned with ensuring that talent within our society develops by combining fields of study and research that are on many occasions separate. Nobody seems to be in any doubt, at least theoretically, as to the importance of educational systems as social development and intervention mechanisms. However, it is not as clear whether the concerns of the majority are aligned with the development of the talent and potential of many young people in our countries, disregarding (whether deliberately or not) the importance that it has for social construction and human liberty.

The educational process becomes the key to transforming natural abilities into systematically developed abilities, to use Gagné's terms. It is obvious that this process has to be systematically structured. In other words, the abilities or aptitudes in one or more fields shall not become naturally "operative" (so to speak). It is the structured training that will make those abilities contribute to the development of competences in a given field.

Consequently, the level of competence and skill, of expertise if you will, in a field of knowledge, shall be the result of the projection of the ability in said field, with the performance in it being the effect of educational development. In this regard, in order to be competent in a field, the abilities appropriate to the requirements of such are necessary but so, too, is an appropriate intervention program and a not inconsiderable amount of work, effort and motivation towards achievement and excellence.

It is therefore crucial to understand that talent is based on (partially inherited) personal conditions that will present themselves (in the majority of cases) in various fields of human activity. However, it is also essential to understand that talent does not develop spontaneously. Consequently, ability must be understood as potential, and talent as performance to a lesser or greater extent, in such a way that talent is the result of applying

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personal effort and willpower to the development of what are initially nothing more than uncertain potentials (cf. Gagné, 2009).

The role of the intervention programs shall be to ensure that potential manifests as performance and that potential manifests as competence[1]. It is therefore easier to understand that there is a significant difference between quantitative reasoning and being a good mathematician or simply having a lot of knowledge (and skills) in the mathematics field. It is true that one needs to have the ability but the work and support to implement this ability to make advanced achievements in a particular field is also necessary.

This, as can be understood, has highly significant educational consequences because, as can be immediately gathered from the aforementioned, any talent that is not cultivated can be lost. However, in order to cultivate talent, it must first be identified. Consequently, identification and intervention become two axes of talent development. It does not seem necessary to insist that education must ensure that an individual's performance matches his/her potential.

> The need for special attention is all the more obvious when it is confirmed that different children who receive the same educational treatment, don't always obtain different results. (Tourón, Peralta, & Repáraz, 1998)

It appears to be beyond all doubt that the organizational structure of the school as we know it today is based on pragmatic criteria. The worst aspect of these criteria is that they lead to an "age-grade lock step", that immediately orientates the school system toward the 'average student', who as an abstract concept, does not exist anywhere. This results in the development of the same programs for all the pupils and at the same pace, a system that is far from capable of responding to the needs of a group with educational needs clearly different from those of the 'regular' groups.

Thus, if the school cannot respond in an adequate manner to the educational needs of all pupils through its established programs, and accepting that groups exist that are clearly differentiated and have specific needs, the identification of talented pupils makes sense, particularly when alternative programs exist to attend to the demands they present.

This is precisely the main focus of this paper, which analyzes with some detail the rationale and research results of the so-called *Talent Search Model*. "A Talent Search is the best-kept secret in gifted education. So if you have no idea what it is you are not alone" (Colangelo, Assouline, & Gross, 2004, p. 25).

The Talent Search Model: A Short Description

Several names have been used to refer to the Talent Search Model. In a relatively recent High Ability monograph, we used the CTY model expression (Center for Talented Youth), also known as the Talent Search Model, or SMPY model (Study of Mathematically Precocious Youth; see Tourón, 2005, Brody, 2009a). Any of these names can be considered as reasonable equivalents even though they all originate from the SMPY, which is the name of the project started by Professor Stanley in Baltimore at the beginning of the 1970s and that continues in place with his 50-year longitudinal study. At present, the SMPY is led by Benbow and Lubinski at Vanderbilt University (see Lubinski & Benbow, 2006, for details). However, as stated by Benbow and Lubinski, the SMPY is a misnomer as it deals not only with the mathematical aspect but also the verbal aspect and it is not only geared towards young people, rather the model has been expanded to include children and adults that currently form part of the cohorts monitored in the longitudinal study (cf. Lubinski & Benbow, 2006).

> There is no question about the magnitude of the contribution of the model described here, both in the States and worldwide. Its success has gone far beyond the limits of any initial prediction that could have been made at its outset by Stanley and his associates. Today millions of students have benefited from the talent searches, programs and services provided by the universities and institutions implementing this model, or other similar models inspired by its rationale. Moreover, the research effort made to validate the model and the educational practices derived from it have been very influential in the shaping of appropriate legislation and adaptation of school practices in many places. (Tourón, 2005, p.155)

Certainly it has expanded a lot further than what Stanley could have predicted when he said, referring to those first moments when he was required to help a student, who we shall discuss later, "*At first I was somewhat hesitant and perhaps even reluctant (and slow) to get involved (...). But I did, and my life and career thereafter have never been the same*" (Stanley, 2005, p. 8).

> (...) The principles and practices of his approach are based on three principles from developmental psychology: (1) that learning is sequential and developmental; (2) that children learn at different rates; and (3) that effective teaching involves posing problems to students slightly exceeding the level already mastered. (...) The implication of this principles is that, for students to develop their talents, 'the pace of educational programs must be adapted to the knowledge of individual children' (Robinson, 1983, p.140).

The SMPY (*Study of Mathematically Precocious Youth*) officially began in September 1971 and its initial objective was to identify and educate high school students who were precocious in mathematics (Benbow, 1986). In the words of Lubinski, Benbow and Sanders (1993), the original aim of the SMPY was to identify adolescents with exceptional intellectual abilities, and later, to find out which factors would contribute to their optimum educational development.

In order to achieve the first of the objectives, the decision was made to perform an annual search for talent called a *Talent Search*, which, since the first year it was implemented, was one of the key elements of the model.

To do this, an above-level evaluation was used, as, according to previous experiences, it seemed to be an adequate identification method. This test would be applied to 7th and 8th grade students within the top 5% of mathematical performance, based on another standardised performance test that they would have taken at school.

The first *Talent Search* was carried out at Johns Hopkins University on 4 March 1972. A total of 450 7th and 8th grade students (12–13 years-old) from Baltimore participated by taking mathematics and science tests that were very difficult for their age group. Many of them obtained results of around 690 points when the maximum that can be obtained in said test is 800. Keating (1974) stated that it was evident that when the aptitude or performance tests are used to evaluate the ability of these students, their results are comparable with those of students who are going to start university.

Other searches followed this one, in January 1973 and 1974, in December 1976, in January 1978 and in January 1979. These were the seed for the inception of CTY (then called OITD, Office for Identification and Talent Development). In the 1982/83 academic year, the *Talent Search* already formed a circuit throughout the United States, adopted by other Universities like Duke, Northwestern and Denver (See Tourón, 2005, special *High Ability Studies* issue on the CTY model) which has continued to grow and continues to be very effective thanks to all of the experience gathered throughout the decades.

Table 1 provides a brief breakdown of some of the data relating to the evolution of this model that show us how it has grown and what its innovations have been.

Stanley (1985) stated that it was a fortunate combination of events that allowed the Spencer Foundation of Chicago to provide a financial grant to the project for 13 consecutive years. This grant was geared towards identifying talent amongst students aged 12 to 15 years. The initial perspective was different, for example, to that adopted in Terman's longitudinal study.

In this case, the idea was to find young people with special talents who could be helped to move, educationally-speaking, more rapidly and in greater depth.

In Stanley's opinion, Terman and Pressey had already provided a lot of information in contrast to the prevailing stereotypes, and had pointed out the need to take appropriate educational measures with the most capable students (Terman & Oden, 1925; Pressey, 1949). However, it is not possible to use these measures without precise knowledge of the young people who need them. Consequently, effective identification was clearly the first step.

Table 1. Some Important Data Relating to the Development of the SMPY (Modified and Expanded from Reyero and Tourón, 2003)

Summer 1968	An IT teacher from Towson State University is astonished by Joe, an 8th grade student (13 years old) who stood out very significantly in his classes.
1969	Julian Stanley, Professor at Hopkins, gives Joe several tests and he gets results that exceed those of the majority of students starting at the university. Stanley has many problems finding acceptable routes for Joe's education. Many of his proposals are considered ridiculous! With Joe's family, he decides that Joe should enrol at Johns Hopkins University, where he receives his BA and Master's aged 17.
1970	The parents of Jonathan, another 13 year-old student, hear about Joe's success and ask Stanley for help, who then follows a similar route with Jonathan. Four years later, Jonathan became an IT consultant.
1971	Julian Stanley establishes the Study of Mathematically and Scientifically Precocious Youth (SMSPY) in the Psychology Department at Hopkins. The Spencer Foundation provides an initial grant for the 5 first years which is later extended to 13 years.
1972	On 4 March, the first Talent Search is performed as a method of identification.
Summer 1972	Fast-paced precalculus mathematics classes on Saturdays throughout the summer. Joseph R. Wolfson was the teacher so this pioneering course is often referred to in literature as "Wolfson I".
1972/1973	Fast-paced mathematics classes continue throughout the year and for the brightest students throughout August 1973 as well. This course is known as "Wolfson II".
From 1974	Fast-paced calculus classes at university level. They are given on a weekly basis for 2 and a half hours.
1978/1979	Summer courses: 40 study hours led by a mentor. They are non-residential.
1979	A new service is set up at Johns Hopkins University encompassing everything that is related to identification within the work of the SMPY. The service is named OTID (The Office of Talent Identification and Development). It handles the annual Talent Searches in cooperation with the SMPY. It is currently called the CTY (Center for Talented Youth).
1980	The "group of 13 year-olds with SAT-M results between 700 and 800" is created with the aim of providing special assistance to these students (1 in every 10,000)
Summer 1980	First summer residential programme takes place over three weeks. Mathematics courses, writing strategies and others. 221 students participate (126 choose mathematics).
1980	This year, verbal results are also included in the identification of the subjects.
1985	The 12th Talent Search is carried out with 23,000 participants.
1992	CTY International is founded. It is an organisation that brings together, under a common model and principles, various similar initiatives that are set up in other countries.
1992	CTY Ireland is founded, the first charter member of CTY International.
1999 (20 years since the foundation of CTY)	90,400 students participate in the Talent Search. A total of 8,100 students attend the summer courses.
1997-2000	The SCAT is validated in Spain and the first studies offering data on the transcultural validity of the identification model begin to be published.
2001	CTY Spain is founded, second charter member of CTY International.
2002-2005	NAGTY is founded at the University of Warwick with the support of the British government which incorporates the same principles as the CTY model. Other CTY's are founded in Bermuda and Thailand. They all form part of CTY International.

Talent Search Principles

The SMPY (which we would refer to as the CTY today) focuses its attention on the *students that are precocious in the verbal and mathematics* areas, even though other efforts are acknowledged and applauded in the identification and strengthening of other areas of talent. The areas that CTY deals with are central to the architecture of all school learning and good precursors to the academic potential of students. In addition, they are easy to evaluate.

The young people with the greatest potential or ability are characterised by their precociousness, by showing, at times exceptional, advancement with regard to what is normal for their age. It is precisely this precociousness that requires a different educational treatment (cf. e.g. Keating, 1976; Benbow, 1986; Keating & Stanley, 1972). The SMPY model views high ability as a synonym of precociousness (Benbow, 1991), and bases this on various research studies on the topic (Jackson & Butterfield, 1986; Keating & Schaefer, 1975; Brody & Stanley, 2005; Stanley, 2005).

There are some principles that are important for gaining an understanding of the model developed by Stanley that, as is evident to us, is the result of the practice and not of a prior theoretical idea, which is not to suggest, in any sense, that it is not perfectly founded on well-defined psycho-educational principles (Brody & Stanley, 2005).

The SMPY assumes a series of postulations on which it bases its action, both in relation to the identification processes and the implementation of intervention programs. According to Brody (1999, 2009b) these assumptions could be summarized as follows:

1. Gifted students need an appropriately challenging program if they are to achieve at their full potential.
2. The more talented the child, the greater the need for a differentiated program.
3. Above-grade-level assessments are crucial for evaluating a gifted student's level of ability and content knowledge.
4. Gifted students vary greatly in their specific abilities, content knowledge, interests, motivation, goals, personalities, and learning styles.
5. Students need access to coursework that is at a level and pace appropriate for their abilities.
6. School programs can be enhanced with curricular flexibility and articulation at the next level.
7. Students can increase their learning opportunities though supplemental educational programs and extracurricular activities.
8. Students should gain a broad background in the liberal arts.
9. Students need to be able to interact with intellectual peers.
10. Students need access to role models and mentors.

In any event, it must be understood that the CTY model was born to help with the intellectual, academic, social, emotional and definitively personal development of students and in this attempt,

> Let me try to correct a widespread, persistent misimpression about our innovations. We do not compete with school-based efforts to provide stimulation for the gifted, such as those of Renzulli and Reis (2004). Our major work is carried out during the summer. Our intent is to supplement and complement school-based instruction, not supplant, criticize or 'invade' it. (Stanley, 2005, p. 10)

The operational definition of talent that the SMPY has been using from the outset is a *high score on the SAT (School Assessment Test) at an early age*. Taking into account that the SAT is a test that is used for identification but above-level, this means that the SMPY sees high ability as a synonym of precociousness (Benbow, 1991), on the basis of several investigations into such (Jackson & Butterfield, 1986; Keating & Schaefer, 1975). In addition, the aim of the SMPY did not only involve identification, it also seeks to provide the educational assistance most appropriate not only to the type of talent but also to its degree or level. For that reason, for Stanley (1991) the identification and the description were insufficient, they had to help the most capable young people to materialise all of their potential with the most appropriate educational measures.

> The practical implications for the SMPY were for us first to identify the appropriate educational and vocational environments for the individual in question, and then attempt to arrange educational interventions congruent with the individual's abilities and needs. (…) Essentially, SMPY promotes competence over age as the criterion to be used in determining who obtains access to certain curricula and experiences and at what time. (Benbow & Lubinski, 1997, p.158)

In principle, the *Talent Search* was seen as an identification mechanism, in which the tests identified those children who stood out because of their talent in the verbal or mathematical areas, and it selected them to participate in special programs. Later on, this idea was re-conceptualised and the *Talent Search* began to be viewed as a diagnostic tool that discovers areas and levels of ability, but in an already acknowledged high-ability population, and offers students different educational modes that are appropriate to their learning pace (Olszewski-Kubilius, 1998).

The idea is that two students, who obtain the same results in a test appropriate to their level, obtain very different results in an above-level test, as shown in figure 1. In other words, if a teacher uses the results that these two students obtain in the test at their level as a basis, he/she will place both students at the same level and offer them the same educational programs. However, if the teacher uses the results gained from the above-level test as a basis, the programs, strategies and resources used with each of them shall be different. There is no doubt that both are gifted but perhaps for one student, an enrichment program would be sufficient, whereas for the other, an advanced mathematics program would be more appropriate, with a faster pace than normal.

> The standardised tests traditionally used to evaluate the academic performance of school students have a "ceiling" which is too low to identify those students whose talents are so exceptional that they require and deserve special educational opportunities. (Goldstein, Stocking, & Godfrey, 1999)

To obtain results in the 99th percentile in a test, for example the *California Achievement Test*, is a significant performance, but the 1% of students who are in this selected group still represent a very broad range of ability. As detailed by Benbow and Lubinski (1993), the top 1% of individuals, in the majority of distributions, span a range as broad as that which is covered by the lowest 2% to the top 2%. In terms of IQ, the range of results for the students that are in the top 1% (from 135 to 200) is as broad as the range of results between the 2nd and 98th percentile (from 66 to 134). Consequently, it is necessary to use above-level tests with the students who obtain the highest results in the in-level tests. As a result, it becomes possible to demonstrate the complete scope of their abilities.

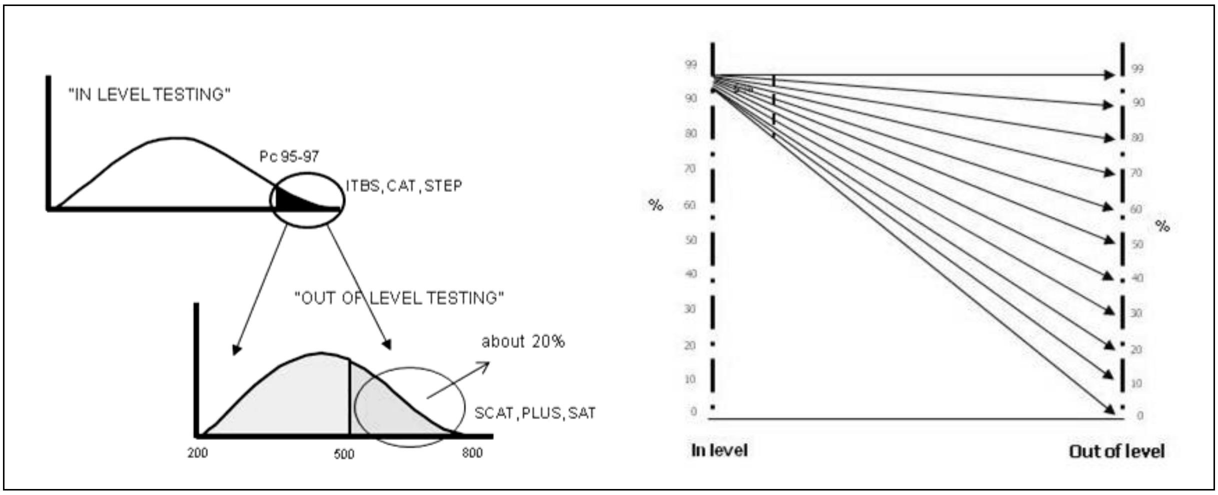

Figure 1. Two representations of the percentile differences in the results of the students that take an in-level and an out of level test.

The innovative aspect of this model, with regards to identification, arises, in our opinion, in two aspects: a) on the one hand, in the *out of level* evaluation, in other words, the use of tests at levels higher than the age of the students evaluated for the identification, and b) in the *description*, on the basis of the student's test results, his/her profile and characteristics are analysed alongside his/her results and the most appropriate manner of intervening in that specific case is determined. In the following, we shall analyse each of these two aspects and explain what the student identification process is.

In order to identify a significant number of students with talent, the SMPY developed the *Annual Talent Search* concept (both national as well as international). It is a basic identification system which is carried out in two stages, and which makes it possible to discover, relatively rapidly and very precisely, students with intellectual talent. It is designed to identify, evaluate and acknowledge students with exceptional mathematical or verbal reasoning skills.

At the Johns Hopkins University CTY, 7th and 8th grade students were traditionally involved in this process but at present, a younger age group of students, 2nd to 6th graders, can also participate and take another test, the SCAT. Talent Search programs are also conducted at other universities in the United States (for example, Duke http://www.tip.duke.edu and Northwestern http://ctdnet.acns.nwu.edu/ Universities; in fact Talent Searches cover all the States of the Union), and the model has also expanded internationally in a significant way during the last two decades (Brody, 2009a; Tourón, 2005).

There are two stages that follow:

1) In-Level Testing

In the first stage, the students who can participate in the *Talent Search*[2] are selected. To be selected they must have reached a high percentile of 95 or 97 in a standardized performance or aptitude test, which will have been given to them, generally speaking, within the normal evaluation process of their schools. The CTY itself offers a very extensive list of tests that enable qualification for the *Talent Search*[3]. This percentile has varied slightly throughout the years.

By way of example, between 1972, the year that the first *Talent Search* was carried out, and 1978, a total of 9,927 students aged between 12 and 14 years participated. The percentage stipulated to pass on to the following stage of the process can vary depending on the year, although it is always between 2 and 5% (Benbow & Lubinski, 1997).

Why the highest 3 or 5%? Goldstein, Stocking and Godfrey (1999), on the basis of the data gathered from their talent search at Duke University, demonstrated that there is a significant difference in SAT results amongst students situated in the 99th percentile of a standardized test for their level and those situated in the 98th or 97th percentile of said test (see table 2).

In other words, below the top 3–4% almost no students obtain a result above 500 in the SAT.

> It is reasonable to conclude that a cutoff lower than the 97th percentile could yield few additional high scorers on the SAT or ACT [American College Testing] and would consequently result in many more experiences of frustration for the participating seventh graders. (Goldstein, Stocking, & Godfrey, 1999, p. 145)

Table 2. Percentage of Students Scoring in the SAT at the Levels Indicated (from Goldstein, Stocking, & Godfrey, 1999)

	Mathematics		Verbal	
SAT score	**480**	**550**	**430**	**500**
Pc. 97	13.4	1.9	8.1	0.8
Pc. 98	16.8	2.7	11.9	1.4
Pc. 99	32.8	9.8	26.6	5.2

In fact, as stated by Goldstein, Stocking and Godfrey (1999),

> TIP[4], and other programs like it, don't seek to exclude students by using the talent search approach but rather seek to identify students who are most likely to benefit from the programs' offering. Therefore it seems appropriate to continue the practice of using the 97th percentile as the cut-off for the talent search, keeping in mind that the cut-off is a guide rather than a barrier. (p. 145)

However, caution must be taken with a cut-off point that is too rigid or too high, as we run the risk of increasing the number of false negatives (see VanTassel-Baska, 1985). At present, many talent searches use the 95th percentile as the cut-off point in order to avoid this possible negative effect[5].

2) Above or Out-Of-Level Testing

This second stage of identification is one of the features that most characterises the SMPY model. The idea of using out of level tests is not a new one but its systematic and annual use to identify high ability students is new. The main advantage is that it makes it possible to discover the intellectual differences that arise amongst the most able students, which are generally hidden when conventional tests are used that tend to have a lack of discriminatory capacity. Those individual differences amongst the students are psychologically very significant and play a very important role in planning and structuring the educational intervention, particularly, if the use of accelerated resources is involved.

Benbow (1992) stated that the differences in the academic performance of young people who are in the top 1% are very evident. In a period of 10 years, between ages 13 and 23, the academic performance of those students in the top quarter of the top 1% for mathematical ability, was much more spectacular than that of those in the lowest quarter of the top 1% who also had a very high performance. Consequently, Benbow and Lubinski (1997) stated that, "differential expectations for individuals in this range, which spans the range of IQ scores from approximately 135 to over 200, are justified and should be established" (p. 159).

The *out of level* evaluation in the *Talent Searches* enables students to find out what their strengths and weaknesses are as regards the intellectual abilities most characteristic of academic excellence: verbal and mathematical reasoning.

It is interesting to note that the SAT basically acts as an aptitude test with young students. In relation to this VanTassel-Baska said that,

> because such younger students usually have not had advanced coursework in Mathematics or the Verbal arts, the scores reflected are more representative of aptitude rather than achievement, thus countering the charge frequently made about the SAT when used with older populations, that it measures achievement rather than aptitude. (VanTassel-Baska, 1985, p.185)

Similarly, with regard to the SAT, Lubinski and Benbow (2006), in their work related to the results of the longitudinal study of the SMPY at age 35[6], stated that,

> given the abstract nature of this measuring tool and the sheer novelty of the problems for this population, the SAT functions more as an analytical reasoning level for these students than it does for older students who have been explicitly exposed to SAT content through course work in high school. (p. 317)

Likewise, Swiatek (2007) stated that, "because above-level tests are given when students are too young to have been taught the test content in school, the results are best viewed as indicators of reasoning ability, not retention" (p. 322). Many other authors support this position (see Jarosewich & Stocking, 2003; Assouline & Lupkowski-Shoplik, 1997)

Although the SAT is the test that has traditionally been used in the model, at present, and given that the groups that can participate in the *Talent Search* have increased, different tests are used and qualifying scores have been modified along the years (see for details: http://cty.jhu.edu/summer/summer-programs.html)

Table 3 shows the data corresponding to the operation of the identification model from the period between 1980 and 2004. The stability of such, with hundreds of thousands of students, makes it possible to speak about what Tourón (2000) calls the "out of level testing law". It must be taken into account that the students that present themselves to the

Talent Search do so voluntarily and, consequently, do not necessarily represent one population; instead due to their high number the result has a significant explanatory capacity.

It must also be taken into account that the 7th and 8th grade students are four to five years younger than the students who normally take the SAT as a requirement for entry into many North American universities.

The fact that students so young are capable of reaching such excellent results is surprising and denotes an extraordinary ability of such in the areas measured by the test.

Table 3, originally compiled up to 2004 by Barnett, Albert and Brody (2005), has been updated with the data up to 2009 kindly provided by the CTY Talent Search department. Systematically, as is evident, around 20% of students in the top 5–3% of their age groups in the "*in level"* test match or exceed the average result of students taking the SAT test as a prior requirement for entry to the university[7], demonstrating a huge range of ability between them.

The evidence of the series leaves little room for speculation and clearly emphasises that the "competence shown" by these students is completely masked in any "*in level"* measurement process, and more so with regard to school tests designed by the teachers frequently geared towards the average student and low levels of difficulty.

Table 3. Percent of Talent Search Students Scoring Above Mean of College-Bound Seniors[a]

	Seventh Grade				**Eighth Grade**			
	SAT-V		**SAT-M**		**SAT-V**		**SAT-M**	
Year	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**	**Males**	**Females**
1980	24	24	20	21				
1981	21	18	20	23				
1982	19	19	15	20				
1983	19	17	16	16				
1984	19	16	17	17				
1985	19	15	19	17				
1986	19	17	19	19				
1987	18	17	19	17				
1988	15	15	19	16				
1989	19	18	14	13				
1990	16	15	23	22				
1991	18	19	14	16				
1992	18	22	22	24				
1993	19	22	18	21				
1994	18	19	21	25				
1995[b]	20	22	19	24				
1996	20	22	19	25				
1997	24	27	24	27				
1998	25	26	25	29	47	49	49	56
1999	22	24	23	29	44	49	47	56
2000	23	24	22	26	43	47	48	54
2001	22	24	27	32	45	47	50	59
2002	25	27	26	28	46	49	52	57
2003	24	26	26	28	45	50	48	53
2004	23	29	28	30	44	54	50	52
2005[c]	22	26	29	27	40	47	48	49
2006	21	25	24	24	38	44	46	45
2007	26	26	29	26	43	46	49	47
2008	27	26	30	30	45	45	51	54
2009	27	33	28	29	43	50	45	48

Note. [a] Since 1979 to 2008 1.572.595 students participated in the CTY Talent Searches (see CTY 2008 Annual Report, online access at: http://ctyjhu.org/press/report2008/ar_frame.html); [b] During this year, the SAT scale was re-centered so that it could adjust to the empirical results of the college bound seniors; [c] During this year, the composition of the SAT changed including a student-written essay; analogies were eliminated; shorter reading passages added; new content from third-year college preparatory math; quantitative comparisons eliminated (see www.collegeboard.org for further details).

This highlights the vital need to articulate systematic (periodic) processes of identification in educational systems. In addition, we will view students who are clearly different, more different even than the most disparate students that can be found in a normal class, as equal. And the worst part is that the educational needs of these students will be ignored, with the personal and professional prejudice which that leads to.

Implementing the Talent Search: The Case of CTY Spain

Although the Talent Search was created in America and is used systematically there, it is categorically not an "American model". The principles behind it and the measurement process it is based on are, to our understanding, universal.

The ceiling effect of any test does not depend on the cultural contexts or on the idiosyncrasy of the populations; it depends on the level of difficulty of the items in relation to the ability of the students. In other words, if the range of difficulty of these is not sufficiently broad in relation to the potential of the students to whom the test is given, the effect will be a masking of the ability, making subjects appear as equal when their ability is, or can be, very different. It is for that reason that the "in level" tests fail when they attempt to evaluate high ability students.

This is a universal principle that goes beyond the model we are studying and that, consequently, must be taken into account in any process of detection or of diagnostics regardless of the test being used; otherwise we would not be equipped to offer the educational assistance appropriate to the various levels of ability.

We are going to refer briefly to the application of the Talent Search principles in Spain (Tourón et al. 2000, 2002, 2004, 2005b).

If we consider the number of Spanish non-university (i.e., primary and secondary) students and calculate a modest top 5% of such, the total resulting amount would be around 350,000[8]. By referring to official figures of students actually identified we found that these barely exceed 4,000, which means that fewer than 2% of students who need specific assistance to develop their potential have been identified.

In Spain, as in many other European countries, it is not common for standardized performance tests to be used that have national or regional norms, and for that reason it is necessary to select the students from that top 3 or 5% differently from how they are selected in the U.S. In this, the evaluations of teachers, parents, self-nominations, nominations from colleagues etc. play a role, and these are all routes that we cannot discuss here.

In the case that we are going to analyse, referring exclusively to CTY Spain, we use the SCAT test, The School and College Ability Test (SCAT), which is a test originally developed by ETS (Educational Testing Service, Princeton) in the early 1970s and now owned by CTY (Johns Hopkins University). The test is designed to measure the verbal and quantitative abilities of students who are in grades 3–12. The first step taken was to validate the SCAT in Spain, a process which began in 1997 and ended in 2000.

Several papers discussing the SCAT validation process in our region have been published in recent years (Brody, Stanley, Barnett, Gilheany, Tourón, & Pyryt, 2001; Tourón & Reyero, 2002; Tourón et al., 2005), so we omit any discussion about it here.

Given that no standardized performance tests are used in our country, as we just mentioned, we use the same SCAT test for the 'in level' test and for the 'out of level' test.

In a standard fashion, we select those students who during the in level stage obtain the results that place them within the top 95 percentile. In order to determine the degree of ability of these students we re-evaluate them with different levels of the SCAT battery and we use the comparison scales in accordance with table 4.

Table 4. SCAT Levels and Norms Used for Out Of Level Testing in Spain

Student grade	SCAT for out of level testing	Norms used for out of level comparisons	Number of years difference
3rd Primary	None	5th Primary	2
4th Primary	Intermediate	6th Primary	2
5th Primary	Intermediate	7th – 8th Secondary	2–3
6th Primary	Advanced	8th – 9th Secondary	2–3
7th Secondary	Advanced	9th – 10th Secondary	2–3
8th Secondary	Advanced	10th Secondary 11th High School	2–3
9th Secondary	None	10th Second. 11th –12th High School	1–3
10th Secondary	None	11th –12th High School	1–2
11th High School	None	12th High School	1
12th High School	None	None	–

As is evident, once the students have exceeded the 95th percentile at the 'in level' stage, they are assessed at the battery level shown in the table. There is an exception which is that of the youngest students who are not re-evaluated and whose results in the first stage are directly compared with the norms of students two years older than them.

The rest of the students are assessed at the battery level immediately above that used at the in level stage, but in addition it is important to note that their results are compared with the norms established for students who are between 2 and 3 years older than them. In this manner, we can appreciate the magnitude of their verbal and mathematical ability compared to older students.

Just to illustrate the functioning of the model in Spain we use a set of data from CTY Spain databases that offer us the in level and out of level scores of a group of students assessed along the years in this center.

Figures 2 and 3 display the results of two groups of 142 and 152 Spanish students in 4th to 10th grades (primary and high school) who in the in level measurement processes carried out by CTY in Spain obtained results that, compared to the scales of their age, placed them in the 95th to 99th percentiles.

Let us take a close look at the graphs. Figure 2 shows that the in level results lead to out of level results that show extraordinary dispersion. By way of example, it can be said that the students, who in the first measurement were placed in the 95th percentile obtain, when compared to test norms developed for students 2 or 3 years older than them, percentiles between 34 and 96 in the out of level stage. The same effect takes place in all of the in level percentiles with variations that tend to be lower the higher the in level result. We can therefore see that students with a 99th percentile in level can obtain out of level values between 61 and 99, and this is probably leading to a new ceiling effect in the latter.

If we refer to the verbal section of the SCAT shown in figure 3, we can observe the same effect. The students who obtain in level results at the 95th percentile present out of level values between 41 and 95. In the highest extreme, that of students with an in level percentile of 99, the out of level dispersion goes from the 72nd to the 99th percentile. This therefore highlights that the ceiling effect is clearly present in the measurements of levels when the tests are not difficult enough for the most able students. It can be observed that the students who obtain the same in level results are in reality very different to one another and consequently also might have different educational needs that must be taken into account.

These data, although limited by their number, perfectly match those presented in a previous study (Tourón et al., 2005) and follow the line of the series shown previously in relation to the processes followed in the U.S.

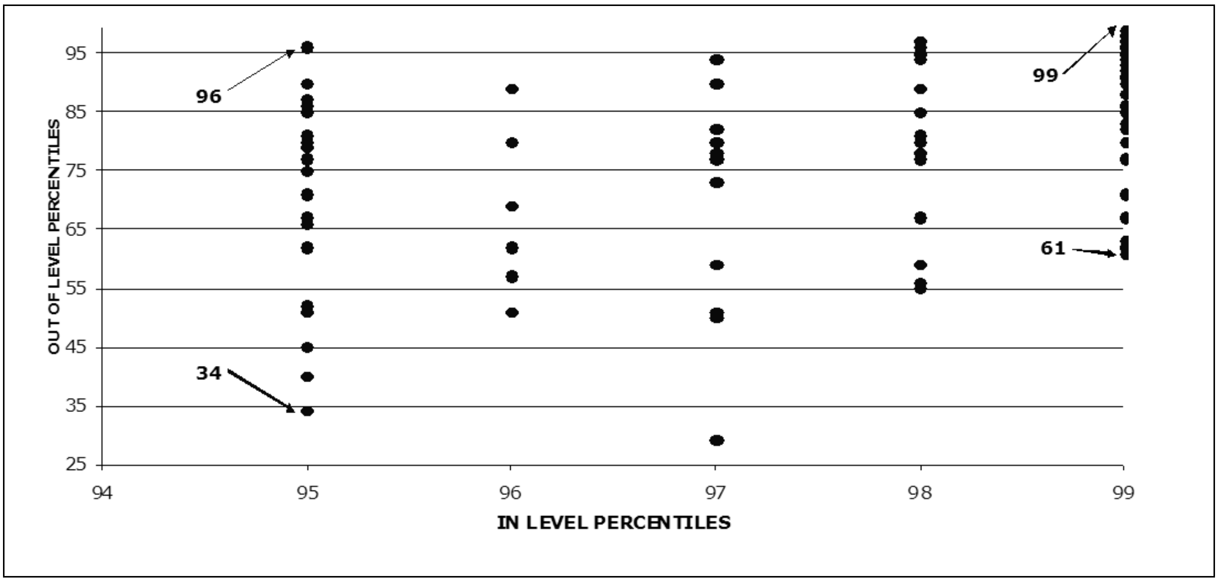

Figure 2. Comparison of In Level and Out of Level Percentiles in a Spanish students sample (Grades 4 to 8, $N = 142$) in the Quantitative Section of the Spanish version of the SCAT.

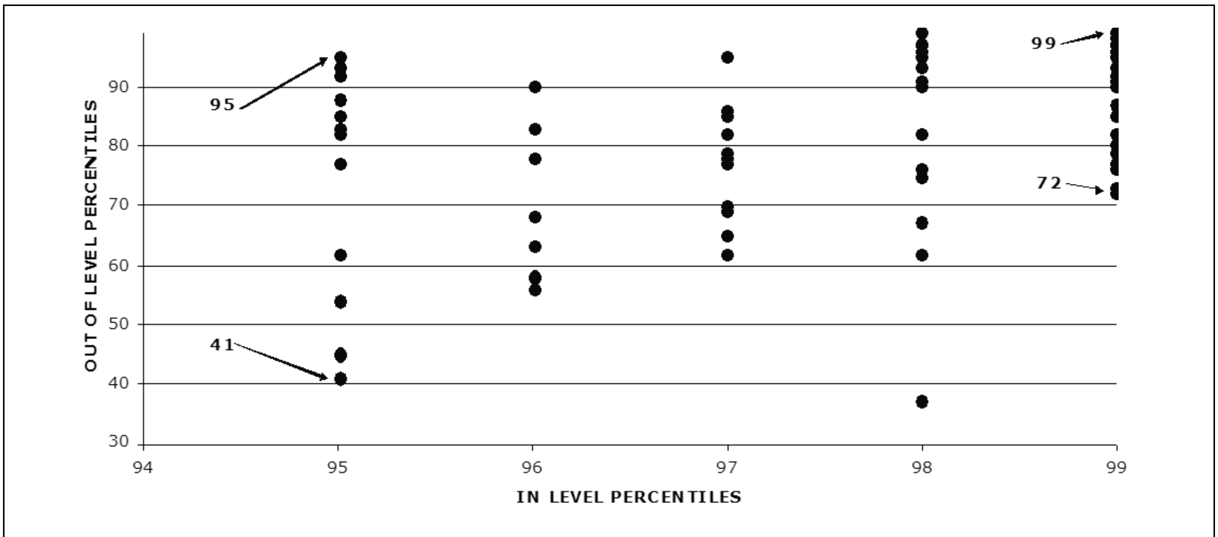

Figure 3. Comparison of In Level and Out of Level Percentiles in a Spanish students sample (Grades 4 to 8, $N = 152$) in the Verbal Section of the Spanish version of the SCAT.

As mentioned previously, it is necessary to acknowledge the intellectual differences between the most able students who far from being a homogeneous group, as some have innocently come to believe, present extraordinary differences and very different educational needs.

Discussion and Implications

The above data illustrate how the ceiling effects take place with our students, in such a different educational and cultural context, providing us a sort of validation of the "pile up" effect that takes place when the tests are not difficult enough for the most capable students. This should be taken into account in any assessment process disregarding the test or the context. If we want to be able to plan adequate measures to serve differently those who are different, the use of out of level measurements is of paramount importance. Its consequences in talent development appear evident.

The school, the educational system, has to be pro-active and not reactive. This implies that systematic and periodic plans for the identification of the most diverse kinds of talent must be generalised (certainly, and as a priority, academic or intellectual talent, which directly affects the school). Talent that is not identified cannot be fostered and if no educational intervention takes place, it will not develop.

It is imperative to foster specific high performance programs for the most capable students or for students with a degree of talent that requires such. The schools should have a plan in place to assist the most capable students in the same way that they do to assist other specific needs, something that occurs only in some countries.

In addition, attempts should be made to find out the implications of social agents on talent development, in and outside school. The schools play an important role, but it must be understood that special programs will be needed that must be developed in collaboration, but outside of school, with the involvement of specific centers for such, and the collaboration of other highly productive and educational institutions: universities, research centers, technological companies, etc.

It is also essential to provide access to the appropriate programs to those students who need them and avoid some of the negative effects suffered by some students for various reasons. Because the schools act as a gate-keeper many students are not afforded the opportunity to be part of a talent search program.

> (…) Programs are too expensive for some students (…). Talent search does a good job for assessing the abilities of children who are already achieving in school. It does not help to identify children who are underachieving or who cannot demonstrate their abilities on the off-level tests because of language differences. (Cf. Olszewski-Kubilius, 2010)
>
> The aim of these practices is to encourage schools to use talent search scores as a vital component of their local programming, to provide education that is truly commensurate with student's abilities" (Seon-Young, Mathews, & Olszewski-Kubilius, 2008, p.57). More research must be carried out into why schools are reluctant to use the talent search data. (cf. Olszewski-Kubilius & Seon-Young, 2005)

All of this strategy cannot and should not be imposed on schools or on the educational system. It must be proposed so that those who wish to join can do so, from the perspective of social initiative and administration and so that it serves as an incentive for others to join. "Excellence in education is an attainable goal, and at reasonable cost (…). Success will go to those individuals and countries which are swift to adapt, slow to complain and open to change" (Scheleicher, 2007, p. 6).

However, it is true that policies must be developed that facilitate the connection between the Talent Search programs and the schools. As stated by Swiatek (2007), "Use of talent search principles of identification and education in the school setting would enhance the education of even more students than the hundreds of thousands already documented in the impressive record of regional talent searches" (p. 328)

Europe can no longer afford to ignore the need to act proactively to identify and foster talent, precisely its most valuable natural resource. Institutions such as ECHA (European Counsel for High Ability) must play a more active and influential role in the preparation of European policies favouring the most capable. We know how to do it. The research has shown us the way. Now we need to think about how we can make the results obtained have an impact on the educational practise of schools and educational systems in general.

Wasting talent, aside from being unfair to individuals is a luxury that our continent cannot afford. As Professor Stanley said, "Let's not forget that they need us today. We will need them tomorrow".

Notes

[1] "Competence" is defined by the OCDE as "the combination of skills, knowledge and attitudes that an individual possesses" (OCDE, 2005).

[2] Although Talent Search is the name given to refer to the whole identification process that

comprises both the "in level" evaluation as well as the "out of level" evaluation, it is common to find the term Talent Search in literature to refer solely to the second part.

[3] Interested reader might visit: http://cty.jhu.edu/ts/tests.html

[4] This program is equivalent to the CTY but it is carried out at Duke University.

[5] See for further discussion about this point the papers cited in the references list from Ebmaier & Schmulback (1989) and Stanley & Brody (1989) response.

[6] It is extremely interesting for the interested reader to review this study that gathers the results of the various cohorts that represent 5,000 students monitored throughout the years. The longitudinal study of the SMPY is the only one of its kind in the world.

[7] The SAT was re-centred in 2000 to make the results on the theoretical scale match the empirical results. Moreover, the verbal section has changed in its structure, nevertheless the data presented seem to continue to show the effect that we want to emphasise here.

[8] By this, we do not mean to say that only the top 5% should be considered as high ability students because in reality, and taking into account that the abilities that may be considered are very diverse and that the research shows that children can have very different profiles, 5% is one of those myths to be dismissed (see Borland, 2008; Renzulli, 1982).

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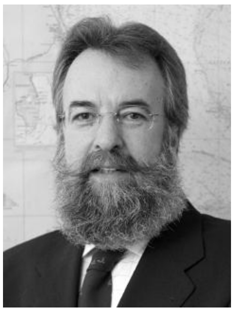

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