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Considering Language, Culture, and Cognitive Abilities: The International Translation and Adaptation of the Aurora Assessment Battery

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This chapter is about the translation and cultural adaptation of a new psychological assessment for intellectual ability, the Aurora Battery, which is currently being developed in the United States, for use in the United States but also around the world. This international aspect of Aurora came about when interest in and inquiries about the project reached the authors from educators and researchers in England, Spain, Saudi Arabia, Russia, Holland, India, Israel, and elsewhere, in addition to those from school districts in various parts of the United States. Collectively, this attention reflects a general, globally occurring need for alternative methods of assessing and understanding children's abilities, and addressing them in educational settings now and into the future. But this common need has also brought forth some interesting questions about language and culture, for although Aurora was developed with a close eye to any potential cultural bias within the United States, such global interest was not fully anticipated. Do most children in Russia know what a treehouse is? Does the Spanish language contain many common homophones, as English does? Will Saudi Arabian children

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understand the meaning of "raining cats and dogs" when the phrase is presented to them in Arabic? As it turns out, a phrase such as "it's raining cats and dogs" can neither be translated literally nor adapted culturally in any meaningful way in Arabic because it has no real equivalent in the Arabic language or the Arab culture.

These kinds of considerations of language and culture have directed the translations and adaptations of Aurora. By *translation* we refer to the linguistic transformation of one language to another; *adaptation* refers to the adjustments in style, presentation, and content that are made to try to eliminate cultural bias and ensure that the assessment is measuring the same construct across cultures (as per Fons van de Vijver's definitions of bias and equivalence; van de Vijver, 2004). These processes are ongoing in the four countries from which researchers have contributed to this chapter. Their accounts are illustrative of the variations and difficulties of linguistic translation and cultural adaptation.

WHAT IS AURORA AND WHY?

The Aurora Battery is based upon Robert Sternberg's theory of successful intelligence, which defines intelligence as the collective and balanced ability to adapt to, shape, and select environments so as to accomplish one's goals, as well as the goals of one's culture or society (Sternberg, 1999). According to this conception of intelligence, memory, analytical, creative, and practical abilities are equally important to intellectual functioning and successful outcomes in life. Aurora attempts to measure these types of cognitive abilities, additionally looking at strengths in verbal, visual/spatial, and numerical content domains within each class of ability as well as across abilities.

Aurora was conceived in 2004 as an alternative or a supplement to the current methods of gifted identification generally applied to school children in the United States, which traditionally have consisted largely of IQ-based measures. It is designed to address the identification and development of intellectually gifted children roughly between 9 and 12 years of age. It may also be used for more highly gifted children who are younger, or for less gifted youths who are older. Measuring a variety of intellectual abilities, it is designed to assess patterns of abilities broader than those assessed by more traditional identification instruments (Chart, Grigorenko, & Sternberg, 2008). The value in this is twofold: First, its broad scope can provide a larger picture of a child's abilities; and second,

it focuses attention on abilities that, as suggested by the theory's name, when actively and mindfully practiced, can lead to success in one's academic as well as personal endeavors.

In its entirety, Aurora is a comprehensive evaluation battery. It includes a group-administered paper-and-pencil portion, a parent interview, a teacher rating scale, and an observation schedule. These various tools were developed to allow the most comprehensive possible examination of an individual's abilities, with the understanding that a paper-and-pencil test provides only one view of a child's range of ability. The teacher rating scale asks a teacher to examine a child's abilities as they are exhibited in how the child functions in the classroom setting (including social skills and the acquisition or display of tacit knowledge); the parent interview explores how children display their abilities in their normal everyday life activities outside of the classroom; and the observation schedule is a set of tasks to be done individually with a child to gauge his or her particular abilities in depth. This chapter will concern only the paper-and-pencil module (Aurora-*a*), which is intended to be group-administered in school or other classroom-like settings and, to date, has been the tool most often translated for use in other countries as it is the most developed and the one that lends itself most readily to translation at this point.

The implications of Aurora and its translations are significant, as it has the potential to exert effects on students' self-concepts and worldviews of education. Group-administered paper-and-pencil tests are generally seen as efficient instruments for use in schools, where the identification of skills and abilities most commonly takes place. The results of such school-administered tests frequently influence important decisions about children's academic futures, as well as students' own self-conceptions (Amrein & Berliner, 2003; Barksdale-Ladd & Thomas, 2000). In addition, the broad acceptance of a new form of assessment can have more general effects by implying new values in education; the use of specific assessments defines the skills and abilities that are considered important and worth examining in school, and hence, naturally affects what is taught in schools and how. It is therefore important that the device be based on a sound and rigorously tested theory of abilities.

In the following pages, Aurora-*a* and its theoretical bases and development will be described; the international rules of translation that serve as guidelines for the translation and adaptation of assessments in general will be considered. We will examine a few prominent examples of assessments that have been translated, then accounts from principal

investigators in England, Spain, Russia, and Saudi Arabia concerning their ongoing translations of Aurora-*a* will be presented.

Of foremost importance is to consider that a test of intelligence developed and validated in one culture may or may not be valid in another culture (Sternberg, 2004). However, unlike the work done with conceptions of intelligence in indigenous cultures (Grigorenko et al., 2001, 2004; Sternberg et al., 2001), in which cultural differences clearly stand out before all language considerations, the work described here is by international researchers who have chosen to work with Aurora because of their familiarity with the theory of successful intelligence and their belief in it as a valid and useful construct for understanding human abilities within their own cultures. For the most part, each of them has already used some Western assessment tools (such as the Wechsler Intelligence Scales for Children, WISC), but feel the need to explore other forms of assessment. However, although they accept that the components of Sternberg's conception of intelligence and the mental representations on which they act are universal, they also must consider the outward manifestations of these components, how they are exercised within a particular culture (both through language and culture or behavior), and therefore the different ways in which they may be measured. The same construct may require different measurement tools in one culture versus another. And so, although each country began with translation (van de Vijver's "application"; van de Vijver, 2004), some subtests have been discovered to require adaptation; in others, new assembly (adaptation to such a degree that practically a new instrument is assembled; van de Vijver, 2004) might be needed. In some sense, the translation and adaptation of Aurora's paper-and-pencil test has thus far constituted an examination of the subtleties of cultural differences in conceptions and expressions of intelligence.

THE PRIMARY TRANSLATION: THEORY TO ASSESSMENT—AURORA'S PSYCHOMETRIC BASES

The first level of translation is that of concept to instrument. Sternberg's theory of successful intelligence (Sternberg, 1999; Sternberg et al., 2004) equally emphasizes the roles of analytical, creative, and practical thinking in the accomplishment of one's goals within one's given environment. According to the theory, each of these types of thinking is important because each can have a powerful effect on the

extent to which one succeeds in life. The theory also holds that each of the three abilities is, to a substantial extent, teachable and learnable. Therefore, examining all three in individuals can usefully inform teaching approaches and direct efforts toward identifying cognitive strengths and weaknesses.

Analytical intelligence is involved in analyzing, evaluating, judging, and comparing, and contrasting. Analytical abilities are exhibited in or recruited by reasoning and logical thinking, as exercised in activities such as persuasive writing, debating, research, and mathematical problem solving. Creative abilities are reflected in the capacity to generate new ideas, and to create and design in activities like writing, drawing, building, and imaginative play. Creative intelligence is particularly well measured by problems assessing how well an individual copes with relative novelty. Practical intelligence is involved when individuals apply their abilities to the kinds of problems that confront them in daily life, such as on the job or in the home. Practical abilities are exercised in leadership and other social interactions, as well as in the adaptation and application of knowledge in real-world problem solving.

To match the paper-and pencil-assessment tasks to the theory, an organizational grid was established. This grid is shown in Table 16.1.

Contained within the grid are the 17 subtests, briefly described, that currently constitute Aurora-*a.* Titles or title words that are in parentheses indicate original subtest names that have since been altered to be more student-friendly. The number of items is shown, as well as the format of each subtest—open-ended (free response), right or wrong (short answers that are scored as correct or incorrect), and multiple-choice. Although the grid in Table 16.1 shows clear lines of demarcation, there are no clear lines separating human cognitive abilities and no pure tests for segregating these abilities into specific content domains. Therefore, although each subtest's primary designation is shown by its place in the grid, these placements are by no means "pure."

RULES AND GUIDELINES FOR INTERNATIONAL TRANSLATION

Previous attempts at assessment translation and adaptation have yielded useful guidelines. A set of these has been published by the International Tests Commission (International Test Commission [ITC], 2001) to ensure conceptual equivalence between different language/culture versions and

Table 16.1

AURORA-*a* GRID: THE AURORA SUBTESTS GROUPED BY TARGET ABILITY AND DOMAIN

	ANALYTICAL	CREATIVE	PRACTICAL
Images (visual/ spatial)	Shapes (Abstract Tangrams): complete shapes with missing pieces. (10 items) (MC) Floating Boats: identify matching patterns among connected boats. (5 items) (MC)	Book Covers: interpret an abstract picture and invent a story to accompany it. (5 items) (OE) Multiple Uses: devise three new uses for each of several household items. (5 items) (OE)	Paper Cutting: identify the proper unfolded version of a cut piece of paper. (10 items) (MC) Toy Shadows: identify the shadow that will be cast by a toy in a specific orientation. (8 items) (MC)
Words (verbal)	Words That Sound the Same (Homophone Blan sentence with two missing words using homonyms. (20 items) (RW) (Limited) Metaphors: explain how two somewhat unrelated things are alike. (10 items)(OE)	(Inanimate) Conversations: create dialogues between objects that cannot typically talk. (10 items) (OE) Interesting (Figurative) Language: interpret what sentence logically comes next after one containing figurative language. (12 items)(MC)	(Silly) Headlines: identify and explain an alternative "silly" meaning of actual headlines. (11 items) (RW) Decisions: list elements given in a scenario on either "good" or "bad" side of a list in order to make a decision. (3 items) (RW)
Numbers (numerical)	Number Cards (Letter Math): find the single-digit number that letters represent in equations. (5 items) (RW) Story Problems (Algebra): (before any algebra training) devise ways to solve logical math problems with two or more missing variables. (5 items) (RW)	Number Talk: imagine reasons for various described social interactions between numbers. (7 items) (OE)	Maps (Logistics Mapping): trace the best carpooling routes to take between friends' houses and destinations. (10 items) (RW) Money (Exchange): divide complicated "bills" appropriately between friends. (5 items) (RW)

Note. MC = multiple choice; OE = open-ended items that need to be scored by an individual using a rating scale; RW = answers are either right or wrong; ( ) in subtest titles = subtest titles or portions of titles no longer in use.

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their original instrument. Sireci (2007) summarizes the most critical steps that should be followed to produce high-quality alternate-language versions of tests as follows: (1) know the culture as well as the language; (2) select translators carefully; (3) involve as many people in the adaptation process as possible; (4) pilot-test the adapted examination; (5) conduct statistical analyses of test quality and comparability; and (6) document the adaptation process. This procedural map establishes standards and guidelines but is not strictly prescriptive. Adaptations of individual tests are somewhat individualized processes, depending upon the type of test, the purposes of the translation, and the nature of the project. In general, though, translation might be described as a procedure of self-checking through various means while engaging in an iterative process of refinement.

Two major examples of cognitive or academic tests and assessments that have been translated internationally are the WISC-III (Wechsler, 1991, 3rd edition; now replaced by the WISC-IV, Wechsler, 2003) and the assessment for the Progress in International Reading Literacy Study (PIRLS; International Association of the Evaluation of Education Achievement, 2001). In both cases, several versions of the original test have been published and the translation and adaptation processes have been refined and improved over the years.

The WISC is an assessment for general mental ability (*g*), involving both verbal and nonverbal tasks, which is designed to be administered to individuals. To translate the WISC-III, each participating country carried out its own particular process for the translation and adaptation of the test. In general, however, as for the adaptation of the earlier WISC-R (Revised, norms published in 1974, precursor to the WISC-III), each country examined the items of the test for cultural bias with respect to gender, racial/ethnic group, region, and religion of the country. Panels of experts and focus groups of examiners targeted items for revision (Weiss, 2003). The aim in each case was to preserve the item's effectiveness as an indicator for the target construct (van de Vijver, 2003); that is, modifications for various cultural understandings were made while attempting to maintain the integrity of the measure. (For more details, consult Georgas, Weiss, van de Vijver, & Saklofske, 2003.)

The PIRLS assessment focuses on the reading achievement and reading behaviors and attitudes of U.S. 4th-graders and their international equivalents. Its translation may be viewed as an example of how complex and intricate the process may be for an assessment whose main intention involves language directly (in this case, the skill of reading). For the translation and adaptation of the PIRLS items, specific guidelines

and procedures were established by the PIRLS International Study Center (ISC) for translating the tests into the national language and cultural context of each target population (Martin, Mullis, & Chrostowski, 2004; Martin, Mullis, & Kennedy, 2007). An English international version was developed first, then each participating country translated all of the materials into the target language(s) and adapted them to the cultural context. The primary focus of each translation was the comparability of reading difficulty and accessibility across the different countries. After the initial translation, each piece was reviewed, with particular attention paid to the readability of the texts for the target population. Cultural adaptations were kept to a minimum, to maintain the readers' understanding without altering the level of difficulty or the intention of the text. All parts of the test were then submitted to two independent translation companies who verified that the meaning of the original test had been maintained. It should be noted, though, that despite this detailed process, some doubts remain as to the validity of the resulting PIRLS translations because of the complexity of accounting for the subtleties of language and comprehension across cultures (Hilton, 2006).

TRANSLATING AURORA ACROSS LANGUAGES AND CULTURES

At this time, Aurora-*a*'s subtests have undergone extensive item-testing, during which different students were administered different subtests and the results were examined for the internal consistency and range of difficulty of items within each subtest. Where item-correlation was below .7, items were discarded and/or added and item-correlation was improved. This was carried out with approximately 1,300 students in the 4th–6th grades. Aurora is currently undergoing validation studies in the United States with small samples in each for Connecticut, New York, and Illinois. Correlations between subtests of the same type (testing for analytical, creative, or practical abilities) thus far have been explored but with only a limited number of such tests; thus, final conclusions are still pending. However, at this point, numerous countries have opted to translate the instrument to explore its possible usefulness in their own cultures.

Following are accounts from England, Spain, Russia, and Saudi Arabia that outline their educational contexts for Aurora and describe their teams' efforts thus far toward adaptation and translation. Despite the historical differences of their countries, the investigators from all four

countries began with an interest in the identification of the gifted population, starting with the acceptance of broader notions of intelligence and a subsequent search for better identification tools. And although each country is at a different stage of Aurora's translation and adaptation (presented in order of later stages of work to early), their common experiences reflect a pattern in the particular challenges and benefits of working with Aurora cross-culturally.

THE USE OF AURORA IN DIVERSE CULTURES

England

It is now more than 80 years since Charles Spearman (1927) wrote his seminal text highlighting his view of the nature of general intelligence, or *g*. Perhaps surprisingly, this view has resisted the challenge of more recent and broader conceptions of intelligence and continues to pervade thinking concerning intelligence and how it should be assessed. Some might argue that it is time the English education system adopted a rather broader notion of what constitutes intelligence and, by implication, what it means to be a gifted student.

As in France, intelligence testing in England was spurred by the introduction of compulsory education at the end of the 19th century. Schools were rapidly populated by large numbers of children whose needs were often poorly understood. Such diversity, in needs and aptitudes, led to the introduction of special schooling, which required appropriate means of assessment. In 1913, Cyril Burt was appointed by the London County Council to be Britain's first professional educational psychologist and from this step eventually grew a massive Child Guidance network in which IQ testing was core to the psychologist's role (Burt, 1957).

For most of the first half of the 20th century, intelligence testing in English educational contexts was largely reserved for identified individuals with special needs. However, the introduction of a selective tripartite system in 1944, with academic, technical, and functional types of schools for children aged 11 and above, necessitated a new form of assessment. The resultant tool, the 11 plus examination, was used to determine the most appropriate type of school for each child. It originally assessed general reasoning skills and mathematical ability but was criticized for having a strong class bias with many more children from middle-class backgrounds achieving success. As a result, it gradually

evolved into a test with less emphasis on curriculum-based knowledge. With the advent of comprehensive schooling in the 1960s, the 11 plus is now used in relatively few geographical areas within England.

A significant transformation in educational assessment practices in England resulted from the introduction of a National Curriculum in 1989. Over the next two decades, teachers became increasingly skilled in undertaking curriculum-based classroom assessments that were complemented by National tests in English, Mathematics, and Science at ages 7, 11, and 14. However, many believe that these statutory assessments, which carry with them high stakes for teachers and schools and encourage teachers under stress to work toward test outcomes, fail to adequately identify giftedness. Segmented into eight levels, each child's academic progress can be monitored by reference to his or her performance in various curricular areas. As a result, judgments about a child's abilities have increasingly been determined by the child's academic performance rather than by tests of underlying intellectual processes.

The identification of gifted and talented students in England during the past decade has been subject to significant Government involvement. As a result, it became policy through the introduction of the Gifted and Talented Strand, which was part of the Excellence in Cities initiative (1999), to identify a 10% cohort of gifted (7%) and talented (3%) children within each school. The term *gifted* refers to those students who are capable of excelling in academic subjects such as English or History. *Talented* refers to those students who may excel in areas traditionally viewed as non-academic, such as music and those requiring visual/spatial skills, such as those having particular abilities in games, physical education, drama, or art; or to those students who are vocationally skilled.

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In England, the responsibility for formally identifying the gifted or talented student rests primarily with the child's school, although a significant minority (6% of secondary and 24% of primary) of schools have failed to comply with this task (Department for Children, Schools and Families, 2008). Government guidelines suggest that identification of gifted and talented students should be a continual, whole-school process that is fair and nondiscriminatory, making use of a wide range of assessment sources, both quantitative (e.g., test scores) and qualitative (e.g., teacher observations). The importance of not making judgments on the basis of the child's performance at a single point in time is stressed. Evaluators are also supposed to take into account the child's rate of progress.

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The need for a tool like Aurora is reflected in the fact that most English schools will identify gifted students primarily on the basis of their performance on the statutory tests in the "core" academic subjects of English, Mathematics, and Science. This is hardly surprising as not only is there a sound infrastructure in England for curricular assessment, based upon the National Curriculum, but also the best predictor of future academic performance is usually the individual's prior performance. Thus, this approach would appear, in the first instance, to be both sound and fair.

However, there are flaws with the use of curriculum-based assessment that mirror those of traditional intelligence testing (Elliott, 2000). First, this approach is of little value in identifying those gifted children who, for whatever reason, have failed to show their underlying potential. Indeed, as it taps directly into ongoing classroom performance, it is, for this particular purpose, likely to be even less valuable than traditional IQ tests, which, on occasion, can reveal intellectual ability not manifested in school. Second, curricular success in England largely involves analytical processing and memorization. Children with particular creative or practical strengths may be identified by their teachers in relation to arts subjects such as drama, ceramics, or photography, but such subjects continue to have low status in schools. Furthermore, without the focused teaching that seeks to apply these abilities to learning in other areas of the curriculum (Sternberg & Grigorenko, 2004), their potential will continue to be marginal. As has been described in previous sections of this chapter, Aurora attempts to compensate for these weaknesses and assess a much wider range of abilities, making it an attractive possible alternative to the current methods of identification.

Prior to the initial testing in England with Aurora, some Anglicization was necessary. In producing the first Anglicized version, a postgraduate research assistant who is an English-language specialist checked all of the items. As a result, a significant number of words and phrases were altered. These included the replacement of words with linguistic equivalents, such as *popsicle* to *ice lolly, mail* to *post, vacation* to *holiday, candy* to *sweets,* and *soccer* to *football.* But it also included replacing terms that would be culturally unfamiliar (or less familiar) to English students, such as *goldfish crackers* to *fish fingers, orchid* to *gladiola, state* to *county, skittles* to *smarties,* and *elk* to *moose.* In addition, all spellings had to be Anglicized, for example, *color* to *colour.*

Initial testing with Aurora began in January 2007 in Hartlepool, a town situated on the northeast coast of England within the Tees Valley

subregion. It is a relatively densely populated town, with a largely monocultural, White population of 90,000 inhabitants, and is characterized by relatively high levels of social deprivation: It is the 23rd most disadvantaged area in the country (out of 354 areas); unemployment is above both the regional and national average; and life expectancy is below the national average. It is served by 30 primary schools, 6 secondary schools, and 4 further-education providers. Only 5.9% of students leaving school at age 16 enter employment, and post-16 education participation rates remain low by national standards.

Schools in Hartlepool previously identified gifted students using both qualitative and quantitative data but, for expediency, relied largely on the results from the National Curriculum tests already discussed. Senior managers from Hartlepool Children's Services were dissatisfied with this form of identification and recognized the potential offered by Aurora for identifying a more diverse cohort of gifted students. Consequently, in January 2007, all 1,200 Year 7 students (age 11–12 years) across the town took Aurora's paper-and-pencil test.

Subsequent to this initial testing, more modifications were introduced to further improve Aurora's design and formatting, and to make it better fit English students' expectations of test appearance. To do this, team members, in conjunction with a panel of local schoolteachers and a School Improvement Adviser from Hartlepool Children's Services, provided a number of suggestions. The Aurora test papers were then redesigned by a professional graphic artist to streamline and unify the test's appearance. The tests were adjusted to look more like the National Curriculum tests in English, Mathematics, and Science that would be familiar to all children in England; for example, items were boxed, a pencil icon was added to indicate where answers should be written, and answer boxes were added. They also underwent general editing to simplify and shorten the instructions, and the titles of the subtests were changed to be more student-friendly.

In addition to these alterations to the subtests themselves, it was realized that, despite the common language, it was preferable if the open-ended subtests were marked by English markers who would be more likely to understand and appropriately judge the idiomatic use of creative language and cultural references in the students' answers. A new set of examples for scoring was compiled for Number Talk, using all English examples as opposed to American ones.

A second round of testing took place in Hartlepool in November 2007 with all Year 6 students (aged 10–11 years) and a selection of Year 5 students (aged 9–10 years). Preliminary feedback from teachers and

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senior managers involved in the improvement process was largely positive but no data are yet available on how beneficial the modifications to the tests have proven to be. Once the test data have been fully analyzed, we will have a clearer picture as to whether further modifications are necessary, and a stronger grasp of Aurora's capacity for identifying children whose potential would otherwise be left unrecognized.

Spain

Historically, in Spain, educational policy has focused on students with special needs, such as learning difficulties and attention deficit, and on those who have experienced academic failure. Relatively little effort and attention have been dedicated to the study of giftedness. In the 1980s, García Yagüe directed the first research carried out in Spain on the nature and identification of giftedness in students (García Yagüe, Gil, De Pablo, & Lázaro, 1986). Since then, Candido Genovard initiated a scientific study of giftedness in Spain with a double aim: to design identification measures and to propose intervention strategies (Genovard, 1990; Genovard & Castelló, 1990). Later on, in Murcia, Lola Prieto (1997) began research directed toward (1) teacher training; (2) the identification of high-ability students; and (3) intervention strategies and the design of programs.

Since the 1990s, different models and theories of giftedness (e.g., triarchic and multiple-intelligences theories) have been examined and employed (Genovard, 1990; Genovard & Castelló, 1990) in the development of research as well as programs for gifted students. Javier Tourón carried out studies concerning the identification of giftedness using a number of different tools, including the Raven's Progressive Matrices (SPM; Raven, 1938), the Renzulli Scales for Rating Behavioral Characteristics of Superior Students (SRBCSS; Renzulli et al., 2002), and the **[AuQ2]** WISC-R (Tourón, Reparaz, & Peralta, 1999). His Center for Talented Youth (CTY) at the University of Navarra, dedicated to the identification of and programming for gifted and talented students, is a notable accomplishment. In addition, in Canarias (Artiles, Álvarez, & Jiménez, 2002) and Madrid (Casanova, 2002), there are now programs for the identification and nurturing of students with diverse high abilities, based on the identification model proposed by Antoni Castelló and Concepció Batlle (1998), which differentiates between giftedness and different talent types (academic talent, verbal talent, special talent, creative talent, logical-mathematical talent).

This same model is also being used in the autonomous region of Murcia, where a research group based at the University of Murcia, supported by the Murcia regional educational ministry and the Fundación Seneca, is applying the Castelló and Batlle model to identify gifted and talented elementary and high school students (Ferrando, 2006; Sánchez, 2006). In addition, they also plan to use the Aurora Battery, with which they hope to broaden the spectrum of examined abilities and to explore the mechanisms of both general and triarchic intelligences.

In the summer of 2007, this team translated Aurora's paper-and-pencil test. Initial changes were made regarding the terms and concepts that would be unintelligible within the Spanish context. Further review by other members of the team polished this initial translation so that all terms and concepts were made appropriate for Spain. Later, external reviews were also solicited as part of the piloting process.

To collect pilot data on the initial translation of Aurora-*a*, the team in Murcia decided to use only those subtests concerning creative abilities, namely, (1) Book Covers, (2) Multiple Uses, (3) Conversations, (4) Interesting Language, and (5) Number Talk. Therefore, the adaptation of these subtests was their primary focus.

A group of 40 Murcia University psychology students were asked to serve as an expert panel to review the translation. These students had experience working in schools; 25%–30% of them were elementary school teachers, and the rest had experience working in other areas of education. Several modifications resulted from this process. For example, the word *kids* was changed to *youths* in the Book Covers example, as it was thought to be more appropriate for an application with 12- to 14-year-olds; in Multiple Uses, the name for item three was changed from *blue glass bowl* to *blue fruit bowl*; and the instructions given for the Number Talk and Conversations tasks were shortened, making them more direct and easy to understand in Spanish. In addition, more text was introduced in the "Tree House and Tree" example in Conversations to more fully express the substance of the English-version example.

In Interesting Language, several changes were introduced. In fact, this subtest required the most work and was, according to the panel, the most complicated to adapt because of the cultural differences in phrases of figurative language. For instance, in the example given at the beginning of the subtest, the figurative phrase used was replaced by a more commonly used Spanish expression.

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Following this phase of adaptation, two teachers from the expert panel volunteered to try out the translation in their schools. The first sample was composed of 24 children ages 7 to 9 years old, from very diverse multicultural backgrounds. The sample from the second school was composed of 22 children aged 8 to 11 years old. Both were public schools serving medium-low income populations. The students were asked to read each item carefully and answer it; this procedure allowed an understanding of how a small sample of 25 boys and 21 girls might interpret and respond to the test items.

In addition, teachers' comments were collected. These comments generally concerned the length of the tasks, even though two sessions had been used to administer them. But teachers also commented on how the children seemed to enjoy the tasks, showing interest and motivation, and that this was especially true of children with special learning needs. Children asked to repeat this kind of activity in the classroom more often.

After this first application of Aurora, it was concluded that the translated language was comprehensible to students and the instructions generally clearly understood by students. Only the instructions for Number Talk seemed problematic, particularly to the 8-year-olds, who needed them to be repeated several times in order to understand them.

Next, data collection began in earnest with two samples of students who were tested using the Aurora creative set. The students in both samples were identified as high-ability students. The first sample was composed of 38 students attending a High School in Yecla (Murcia) from 13 to 15 years old (25 males and 13 females). Gifted and talented identification had been made based on the following measurements: (1) teacher, parent, and peer observation scales based on multiple-intelligences theory; (2) the Differential Aptitude Test (DAT; Bennett, Seashore, & Wesman, 1986, an instrument aimed at measuring IQ and different abilities such as spatial, verbal, reasoning, and so on; (3) the Baron Emotional Intelligence Questionnaire (EQ-i: YV; Bar-On, 1997, 2004), a 60-item self-report that measures five scales—an intrapersonal scale, an interpersonal scale, a stress-management scale, an adaptability scale, and general mood; (4) the NEO Big Five (McCrae and Costa, 2003), a personality questionnaire for ages 8–15 years old; and (5) subtest three of the Torrance Tests of Creative Thinking (TTCT; Torrance, 1966) figural version. **[AuQ3]**

The second sample was composed of 40 primary-level students attending a special weekend program for gifted and talented students. These students

had been identified either as gifted or talented using the Castelló and Batlle (1998) model. In general, they showed verbal, academic, mathematical, spatial, or creative talents. They came from a middle socioeconomic level background (i.e., their parents were generally professionals, such as teachers, doctors, architects, or workers in the service sector). The measures used in their identification were (1) teacher screening, teacher nomination; (2) an IQ test; (3) the TTCT; (4) the Cattell Personality Test (Early School Personality Questionnaire [ESPQ] or Children's Personality Questionnaire [CPQ] was used, depending on the student's age), which targets 14 dimensions of personality taken from a factor analysis of personality performed by Porter and Cattell (1963); and (5) Bar-On's EQ-i: YV.

Currently, Murcia's research team is engaged in the initial translation of the rubrics, which will allow for the scoring of all the collected data. In the next step, while applying these rubrics, the further adaptations that will be necessary to effectively use Aurora in the Spanish culture will be determined.

Russia

To begin to understand how a test battery such as Aurora might fit into Russia's current philosophy concerning education, one must begin with the relatively recent changes in Russia's educational system on the national level. One of the national projects currently being realized in Russia, whose main goals involve innovative education and, therefore, receptivity to new ideas, is called *Education* (Prioritetnyj nacional'nyj proekt "Obrazovanie," 2007). This project is supported by government officials working in the Intellectual Potential Department and its workgroup called *Gifted Generation* (Maksimov & Chernenko, 2007), which focuses on the need to identify gifted children and realize their potential in Russia.

Russia's current interest in innovative approaches to the measurement and understanding of intellectual potential is great. Naturally, then, the question of how this potential is reflected in science and measured in practice has arisen. Because of Russia's social and political history, the process of answering it has necessarily involved looking outward to the international community.

Russia's long history of "testing" being prohibited by law started in the 1930s, when the development of psychometrics and research on assessment in Russia were put on hold (Postanovlenie, 1974; Shmelev, 2004) because of both ideological issues and the objective misuses of existing

tests (e.g., the Binet-Berit). Although many studies on how different abilities are related to academic success, life achievement, and salaries have been conducted by cognitive and educational psychologists (and psychometricians), such research programs have only recently been developed in Russia and most of them are based on methods developed by foreign psychologists. This is primarily because Russian psychologists have only a handful of psychometric instruments available. Three of the most popular and well-known are the WISC-III, Raven's Progressive Matrices, and Amthauer's IST[1] (1973). However, these tests went through revalidation, restandardization, and renormalization procedures more than 15 years ago, during socioeconomic and cultural conditions that differed significantly from present conditions. In addition, because of the prohibition on testing, there is no "tradition" of testing in Russia and the criticism of testing is still influential. **[AuQ4]**

It was not until the early 1990s, when the Soviet Union ceased to exist and the prohibition on testing was lifted, that Russian psychologists began substantially to increase their exchange of ideas with foreign colleagues to develop new approaches to intelligence and giftedness. Three main approaches have recently appeared and are being developed at the present time. One regards intelligence as a range of ability based on an individual's IQ, level of motivation, and level of special knowledge (or "crystallized intelligence") (Druzhinin, 1999). The second one focuses on intellectual behavior as the product of an ongoing development process (Ushakov, 2003). The third proposes a model of "mental experience" as the basis of intellectual activity, describing it in such terms as mental structures, mental space, and mental representations that underlie individuals' attitudes toward the world itself and that determine the specific attributes of intellectual activity (Kholodnaya, 2002). However, these approaches, as well as Talyzina's (Talyzina & Karpov, 1987) attempt to implement activity theory categories into intelligence testing, did not result in any real assessment inventories that could make individual and group diagnostics possible.

Aurora-*a* is currently undergoing translation and adaptation in Russia because it provides a fundamental, validated basis for the assessment of three kinds of abilities in a single battery. For example, the idea of practical thinking has been developed more theoretically than practically in Russia (Teplov, 1985; Zavalishina, 2005), but current implementations of Sternberg's theory reveal that it is extremely important to include different abilities and domains in assessment inventories. This complex approach to intelligence, as proposed by Sternberg and illustrated by

several corresponding methods, has recently shown high predictive validity in terms of academic achievement in Russian student samples as well (Grigorenko & Kornilov, 2007). This predictive quality is of interest to Russian educators. However, in addition to this achievement-related function, it is also important to recognize that compared with the existing individually and group-administered test batteries, Aurora provides the opportunity to assess a broader range of abilities (analytical, creative, practical), and this tested range can serve the goal of identifying gifted individuals, their cognitive strengths and weaknesses, and specific abilities profiles. It is hoped that Aurora may help bridge the gap between the theories, practice, and specialists in different settings (e.g., clinical, psychological, and educational). These professionals might then gain access to an instrument that can help them explore individuals' potentials, and then make corresponding decisions based on reliable, comprehensive, and complex assessment results.

The translation and adaptation of Aurora's paper-and-pencil test into Russian is being realized by a team from the Department of Psychology at Moscow State University (also referred to as MGU or Lomonosov University). The main issues that the Russian Aurora Team faces are both linguistic and cultural.

Linguistically, as expected, the numerical and figural subtests of Aurora did not require much adaptation, whereas the verbal ones did. The main problem was finding linguistic alternatives for particular items that would translate properly the structure and psychometric intention of a subtest or item "idea." The Russian language has a few peculiarities that made these problems even more challenging: specific phonological patterns, word endings, sentences that lack main parts of a sentence, and optional order of words in sentences.

The cultural issues for translation and adaptation are more various. The main problems concern the difficulty of translating conceptions, and therefore, measurements of practical intelligence and tacit knowledge that may be specific for particular occupational settings and cultures. The "practical" subtests of Aurora were adapted to reflect the present socioeconomic and cultural situations in Russia. For example, in the Decisions subtest, the story problems requiring children to make decisions based on different facts had to be adjusted to reflect the Russian social values involved in the process of acquisition and to take into account the cultural norms and the behavioral patterns invoked by these different situations. For example, when test-takers are asked to provide reasons for and against the idea of buying an old bicycle now

versus a new one later, Russian children might be confused, as buying an old bicycle does not correspond with their social reality. That in turn is because the idea of buying an old bicycle in the post-Soviet culture is strongly associated with poverty and such beliefs can affect reasoning and decision making.

Second, there are numerous issues concerning both cultural and linguistic differences in metaphorical and creative thinking among American children as compared with Russian children. As a result, subtests that include metaphorical thinking (e.g., Interesting Language) had to be rewritten. Subtests measuring creative abilities (Book Covers, Multiple Uses, Conversations, and Number Talk) will also require rubrics that remain true to the theoretical framework but that adjust for different types of responses because, for example, creativity measurement that takes into account originality and novelty is in part culture-dependent (Lubart, 1990; Rudowicz, 2003).

Finally, there is a cultural issue beyond the test structure or content: the introduction of Aurora into the educational culture of Russia. This introduction will require us to find a way to recruit schools in the standardization program, train administration and scoring personnel, and adapt testing packets to the length of the classes. By addressing all of these various elements, it is hoped that Aurora may be successfully adapted to the present cultural and socioeconomic environment in Russia for use by a broad range of professionals.

Saudi Arabia

The interest in identifying gifted children and nurturing their abilities in the Kingdom of Saudi Arabia (KSA) and other Arab countries started roughly in the last quarter of the last century. But this interest did not crystallize into a methodological and academic endeavor in the KSA before 1990, when the findings of the first study ever in the KSA, entitled "The National Program of Identifying and Nurturing Gifted Children," were published. This study was sponsored by the King Abdul-Aziz City for Sciences and Technology. It officially adopted and Arabized the WISC-R and the figural battery of the Torrance Tests of Creative Thinking. It also developed the General Aptitudes Scale-Group Test (a scholastic aptitude scale). Since then, the scales used in identifying gifted children have been limited to the WISC-R, the General Aptitudes Scale and, though infrequently, the TTCT.

The increasing concentration on the usage of these largely traditional intelligence scales in identifying gifted children has suffered a great deal of criticism from scholars in the KSA and in the Arab world in general. Though educationalists working in the field of nurturing gifted children have censured these traditional scales for their inability to recognize the multifaceted nature of children's intellectual gifts, and a great number of researchers have called for the importance of incorporating into such traditional scales the recognition of creative skills and personal skills—on the understanding that giftedness is not a linear but a multifaceted concept that is affected by and affects the individual's personal and emotional traits—such studies have not resulted in any academic scale dealing with the main multifarious issues of giftedness in one unified scale.

These criticisms of the use of the WISC-R and other traditional tests do not refer to any weakness of the scales either in structure or objectivity. On the contrary, these tests exhibit a great deal of objectivity and credibility, a fact that has helped them stand the test of time over a whole century. However, their weak point lies in their inability to tap the various aspects of giftedness identified by modern international research (Coleman & Cross, 2005; Gagne, 1995; Gardner, 1999; Renzulli, 1978; Sternberg & Grigorenko, 2002; Tannenbaum, 1983; Ziegler, 2005). These scales, both individual and group, rely on the primacy of so-called general abilities (*g*, as measured more broadly by IQ), a notion that has become outdated by current research (Chart et al., 2008; Guilford, 1967; Hadaway & Marek-Schroer, 1992). Therefore, the process of recognizing the gifted through such scales can never fulfill the vision upheld by the academic and vocational authorities that are interested in nurturing gifted children in the KSA.

Additionally, the General Aptitudes Scale, which was developed by the King Abdul-Aziz City for Sciences and Technology, and which is commonly used in the KSA today, has lost its effectiveness because its contents have not been updated since its establishment in the mid-1990s. Accordingly, there is an urgent need to have a set of modern, authentic tools—an individual scale, a group scale, a teacher rating scale, and an observation tool—which collectively can serve to identify gifted children in the Arab world in general and in the KSA in particular so that appropriate educational services for the gifted can be developed. The Aurora Battery is considered a significant qualitative transition in the field of measuring cognitive abilities, as it has broken the traditional limitations of most well-known scales that focus only on memory and

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analytical thinking skills. To our knowledge, there is no comparable battery available in the field right now.

In the Saudi Arabian team's ongoing efforts to adapt the Aurora Battery Scale to the Arab culture, they have recognized certain factors that require specific attention. First, the instrument is not culturally neutral, as it is mainly based on Western culture. Such a feature is quite a serious challenge, as it could certainly negatively influence student performance, especially in the Saudi environment. For example, in the subtest that employs figurative language (Interesting Language, Creative-Verbal), one finds phrases and concepts like "it's raining cats and dogs," which are hard to translate into Arabic. That is, they are very easy to translate literally, but the purely literal translation is meaningless in the Arabic language and culture.

Second, those who translate the instrument need to make sure that the items used to test specific psychological traits and features maintain their psychometric qualities through the translation. Such a goal cannot be realized by those who have only linguistic competence; translators must also have a good background in the philosophy and the dimensions of the scale itself.

Third, it is necessary to follow rigorous research procedures that will eventually lead to valid and stable results. The Saudi team intends to create Arabic norms for the Aurora Battery using the following procedure: (1) translating the battery; (2) modifying it to the Arabic culture; (3) comparing the translated version with the modified one; (4) forming a reviewers' committee and a language and culture editing committee for the Arabic draft of the battery; (5) applying the tools on a small pilot sample; and (6) administering the battery to many representative samples of Saudi society, which will allow meaningful statistical analyses to be carried out on the collected data. In this step, the internal consistency and cross-time stability will be assessed through reapplication of the tool, if possible. It is expected that the sample for this study will consist of 1,000–1,500 participants. The final step will be the translation of the instruction manual and the directory for using the tools of the scale. The accumulation of data will be ongoing and further revisions will be made, if necessary, at different stages of the usage of the battery in the Arab countries.

In this mission, the Saudi team has chosen to use the term *test adaptation* rather than *test translation* to indicate that the mission is not simply to replace words in one language with words of a different language. Instead, the mission is to go beyond the literal translation and to

take into consideration aspects of the Arabic culture as well as language; this procedure will then result in an assessment that will provide a high degree of reliability, validity, and practical usability in the Arabic context. It is believed that this battery is a real qualitative transition in the field of identifying gifted children.

CONCLUSIONS

As these various countries illustrate individually, Aurora is timely, emerging as many nations are reevaluating their current notions of giftedness and intelligence and searching for new or modified ones. However, obstacles do exist in the translation and adaptation process, particularly concerning different cultural notions of practical and creative thinking, and concerning those subtests that use particular forms of language (e.g., figures of speech, homophones, ambiguous "headlines"). The complexities of maintaining equivalencies cross-culturally with respect to meaning, psychometric construct measurement, and item difficulty present daunting challenges, and each country's challenges will differ from the others'. Saudi Arabia's adaptations for cultural context will most likely be greater than England's; both Spain and Russia may need to pay greater attention to linguistic equivalencies; and in Russia, administration processes may prove more perplexing than in other countries as the culture emerges from a period of no testing. However, the nature of the necessary adjustments in all four countries remains to be determined as they work their way through the process of translating, piloting, and revision. Only subsequent thorough data analyses can inform the proper evaluation of these translations.

In conclusion, as these various countries illustrate, collectively, the process of translation and adaptation of assessments is intricate and lengthy, and becomes more so as we try to globalize more complicated measures. Tests for academic achievement or knowledge are less complicated than those for cognitive abilities; tests for more narrow conceptions of cognitive abilities (analytical only) are less complicated than those for broader, multifaceted conceptions of intelligence. What is *global*? It is a term that seems to make the world smaller but cannot cure the world's complexity. However, these countries' dedication to this investment reinforces the promise of Aurora and the hope that the battery can eventually work with integrity internationally.

NOTE

1. The IST-70 (Intelligence Structure Test) is a group-administered intelligence test developed by Rudolf Amthauer (1973). It is based on the general-factor concept and gives a general IQ score as well as memory, spatial, verbal, and mathematical abilities scores. IST-70 for ages 13 to 60 is one of the best-known and commonly used psychodiagnostic instruments in Russia. **[AuQ5]**

REFERENCES

Amrein, A. L., & Berliner, D. C. (2003). The effects of high-stakes testing on motivation and learning. *Educational Leadership, 60,* 32–38.

Artiles, C., Álvarez, J., & Jiménez, J. E. (2002). *Orientaciones para conocer y atender al alumnado con altas capacidades, guía para las familias* [Guidelines for knowing and responding to students with high potential: a guide for families]. Tenerife: Consejería de Educación Cultura y Deportes del Gobierno de Canarias, Dirección General de Ordenación e Innovación Educativa.

Barksdale-Ladd, M., & Thomas, K. F. (2000). What's at stake in high-stakes testing: Teachers and parents speak out. *Journal of Teacher Education, 50,* 384–397.

Bar-On, R. (1997). *The Emotional Quotient Inventory (EQ-i): A test of emotional intelligence*. Toronto, Canada: Multi-Health Systems, Inc.

Bar-On, R. (2004). The Bar-On Emotional Quotient Inventory (EQ-i): Rationale, description, and summary of psychometric properties. In G. Geher (Ed.), *Measuring emotional intelligence: Common ground and controversy* (pp. 115–146). Hauppauge, NY: Nova Science.

Bennett, G. K., Seashore, H. G., & Wesman, A. G. (1986). *Differential Aptitude Tests for Guidance*. Oxford: The Psychological Corporation. (Spanish adaptation 1992, Buenos Aires: Paidós)

Burt, C. (1957). *The causes and treatment of backwardness* (4th ed.). London: University of London Press.

Casanova, M. A. (2002). La atención del alumnado con altas capacidades en la Comunidad de Madrid [Attention to students with high abilities in Madrid]. *Bordón, 54,* 457–461.

Castelló, A., & Batlle, C. (1998). Aspectos teóricos e instrumentales en la identificación del alumno superdotado y talentoso: propuesta de un protocolo [Theoretical and instrumental aspects of gifted and talented identification: a proposal for a protocol]. *FAISCA, 6,* 26–66.

Chart, H., Grigorenko, E. L., & Sternberg, R. J. (2008). Identification: The Aurora Battery. In J. A. Plucker & C. M. Callahan (Eds.), *Critical issues and practice in gifted identification* (pp. 345–365). Waco, TX: Prufrock Press.

Coleman, L. J., & Cross, T. L. (2005). *Being gifted in school: An introduction to development, guidance, and teaching* (2nd ed.). Waco, TX: Prufrock Press.

Department for Children, Schools and Families. (2008). *Pupil level annual school census*. London: Author.

Druzhinin, V. N. (1999). Struktura psihometricheskogo intellekta i prognoz individualnyh dostizheniy [Structure of psychometric intelligence and prognosis of individual achievements]. In A. N. Voronin (Ed.), *Intellekt i tvorchestvo* (pp. 5–29). Moscow: IP RAN.

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Elliott, J. G. (2000). The psychological assessment of children with learning difficulties. *British Journal of Special Education, 27,* 59–66.

Ferrando, M. (2006). *Creatividad e inteligencia emocional: un estudio empirico en alumnos con altas habilidades, tesis doctoral* [Creativity and emotional intelligence: an empirical study with high ability students, a doctoral thesis]. Murcia, Spain: Universidad de Murcia.

Gagne, F. (1995). The differentiated nature of giftedness and talent: A model and its impact on the technical vocabulary of gifted and talented education. *Roeper Review, 18*(2), 103–111.

García Yagüe, J., Gil, C., De Pablo, C., & Lázaro, A. (1986). *El niño bien dotado y sus problemas* [Gifted children and their problems]. Madrid, Spain: Cepe.

Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century.* New York: Basic Books.

[AuQ6] Genovard, C. (1990). *Estudio preliminar sobre la identificación del alumno superdotado.* Madrid: Fundación Juan March, Serie Universitaria 250.

Genovard, C., & Castelló, A. (1990). *El límite superior. Aspectos psicopedagógicos de la excepcionalidad intelectual* [The upper limit: Psychopedagogical aspects of intellectual exceptionalism]. Madrid, Spain: Ed. Pirámide.

Georgas, J., Weiss, L. G., van de Vijver, F. J. R., & Saklofske, D. (Eds.). (2003). *Culture and children's intelligence: Cross-cultural analysis of the WISC-III.* San Diego: Academic Press.

Grigorenko, E. L., Geissler, P. W., Prince, R., Okatcha, F., Nokes, C., Kenny, D. A., et al. (2001). The organisation of Luo conceptions of intelligence: a study of implicit theories in a Kenyan village. *International Journal of Behavioral Development, 25*(4), 367–378.

Grigorenko, E. L., & Kornilov, S. A. (2007). Akademicheskiy i prakticheskiy intellekt kak faktory uspeshnosti obuchenija v vuze [Academic and practical intelligence as factors of successful learning in university]. In S. D. Smirnov (Ed.), *Kognitivnye i lichnostnye faktory uchebnoj dejatelnosti: Sbornik nauchnyh statey* (pp. 34–48). Moscow: Izd-vo SGU.

Grigorenko, E. L., Meier, E., Lipka, J., Mohatt, G., Yanez, E., & Sternberg, R. J. (2004). Academic and practical intelligence: a case study of the Yup'ik in Alaska. *Learning and Individual Differences, 14,* 183–207.

Guilford, J. P. (1967). *The nature of human intelligence.* New York: McGraw-Hill.

Hadaway, N., & Marek-Schroer, M. F. (1992). Multidimensional assessment of the gifted minority student. *Roeper Review, 15*(2), 73–77.

Hilton, M. (2006). Measuring standards in primary English: Issues of validity and accountability with respect to PIRLS and National Curriculum test scores. *British Educational Research Journal, 32,* 817–837.

International Test Commission (ITC). (2001). International guidelines for test use. *International Journal of Testing, 1,* 93–114.

Kholodnaya, M. A. (2002). *Psikhologia intellekta: paradoksy issledovaniya* [Psychology of intelligence: Paradoxes of research]. Moscow: Piter.

Lubart, T. I. (1990). Creativity and cross-cultural variation. *International Journal of Psychology, 25,* 39–59.

Maksimov, N., & Chernenko, E. (2007). Vunderkindy: Uznat' genija [Child prodigies: To recognize the genius]. *Russkiy Newsweek, 22*(147). Retrieved November 30, 2007, from http://www.runewsweek.ru/theme/?tid=118&rid=1872

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Martin, M. O., Mullis, I. V. S., & Chrostowski, S. J. (Eds.). (2004). *TIMSS 2003 Technical Report.* Chestnut Hill, MA: Boston College.

Martin, M. O., Mullis, I. V. S., & Kennedy, A. M. (Eds.). (2007). *Progress in International Reading Literacy Study (PIRLS): PIRLS 2006 Technical Report.* Chestnut Hill, MA: Boston College.

McCrae, R. R., & Costa, P. T. (2003). *Personality in adulthood: A five-factor theory perspective.* New York: Guilford Press.

Porter, R. B., & Cattell R. B. (1963). *The Children's Personality Questionnaire*. Champaign, IL: Institute of Personality and Abilities Testing. (Spanish adaptation 1990, Madrid: TEA editions)

Postanovlenie CK VKP(b) ot 4 ijulya 1936 g. (1974). "O pedologicheskih izvrashenijah v sisteme Narkomprosov" [The Resolution of Central Committee VKP (b) of 4 July 1936 "On Pedological Distortions in the System of Narkompros"]. In *Narodnoe obrazovanie v SSSR: Sbornik dokumentov.* Moscow: Yurid. Lit.

Prieto, M. D. (Ed.). (1997). *Identificación, evaluación y atención a la diversidad del superdotado* [Identificatiion, evaluation and attention to the diversity of the gifted]. Málaga, Spain: Aljibe.

Prioritetnyj nacional'nyj proekt "Obrazovanie" [Priority National Project "Education"]. (2007). Retrieved from http://www.rost.ru/projects/education/education_main.shtml

Raven, J. C. (1938). *Standard Progressive Matrices, Sets A, B, C D and E*. London: H. K. Lewis & Co.

Renzulli, J. S. (1978). What makes giftedness? Re-examining a definition. *Phi Delta Kappan, 60,* 180–181.

Renzulli, J. S., Smith, L. H., White, A. J., Callahan, C. M., Hartman, R. K., & Westberg, K. L. (2002). *Scales for rating the behavioral characteristics of superior students, technical and administration manual* (Rev Ed.). Mansfield Center, CT: Creative Learning Press.

Rudowicz, E. (2003). Creativity and culture: A two way interaction. *Scandinavian Journal of Educational Research, 47,* 273–290.

Sánchez, C. (2006). *Configuración cognitivo-emocional en alumnos de altas habilidades: tesis doctoral* [High ability students' cognitive-emotional configuration, a doctoral thesis]. Murcia, Spain: Universidad de Murcia.

Shmelev, A. G. (2004). Test kak oruzhie [Test as a weapon]. *Psihologija. Zhurnal Vysshej Shkoly Ekonomiki, 1,* 40–54.

Sireci, S. G. (2007). *Guidelines for adapting certification tests for use across multiple languages.* Retrieved November 15, 2007, from http://www.cesb.org/Guidelines%20for%20Adapting.html

Smirnov, S. D. (2007). *Pedagogika i psihologija vysshego obrazovanija. Ot dejatel'nosti k lichnosti* [Pedagogics and psychology of higher education: From activity to personality]. Moscow: Academia.

Spearman, C. (1927). *The abilities of man.* London: Macmillan.

Sternberg, R. J. (1999). The theory of successful intelligence. *Review of General Psychology, 3,* 292–316.

Sternberg, R. J. (2004). Culture and intelligence. *American Psychologist, 59,* 325–338.

Sternberg, R. J., & Grigorenko, E. L. (2002). Difference scores in the identification of children with learning disabilities: It's time to use a different method. *Journal of School Psychology, 40*(1), 65–83.

Sternberg, R. J., & Grigorenko, E. L. (2004). Successful intelligence in the classroom. *Theory Into Practice, 43,* 274–289.

Sternberg, R. J., Nokes, C., Geissler, P. W., Prince, R., Okatcha, F., Bundy, D. A., et al. (2001). The relationship between academic and practical intelligence: A case study in Kenya. *Intelligence, 29*, 401–418.

Sternberg, R. J., The Rainbow Project Collaborators, and the University of Michigan Business School Project Collaborators. (2004). Theory-based university admissions testing for a new millennium. *Educational Psychologist, 39,* 185–198.

Talyzina, N. F., & Karpov, Y. V. (1987). *Pedagogicheskaja psihologija: psihologija intellekta* [Educational psychology: Psychology of intelligence]. Moscow: Izd-vo MGU.

Tannenbaum, A. J. (1983). *Gifted children: Psychological and educational perspectives.* New York: Macmillan.

Teplov, B. M. (1985). *Um polkovodtsa* [Mind of a commander]. Moscow: Pedagogika.

Tikhomirov, O. K. (1984). *Psihologija myshleniya* [Psychology of thinking]. Moscow: Izd-vo MGU.

Tikhomirov, O. K. (2006). *Psihologija: Uchebnik* [Psychology: Textbook]. Moscow: Vysshee obrazovanie.

Torrance, E. P. (1966) *The Torrance Tests of Creative Thinking: Norms-Technical Manual Research Edition—Verbal Tests, Forms A and B, Figural Tests, Forms A and B.* Princeton NJ: Personnel Press.

Tourón, J., Reparaz, C., & Peralta, F. (1999). The identification of high ability students: Results of a detection process in Navarra (Spain). *High Ability Studies, 10,* 163–181.

Ushakov, D. V. (2003). *Intellekt: strukturno-dinamicheskaja teoriya* [Intelligence: Structural-dynamical theory]. Moscow: IP RAN.

Van de Vijver, F. J. R. (2003). Principles of adaptation of intelligence tests to other cultures. In J. Georgas, L. Weisss, F. J. R. van de Vijver, & D. Saklofske (Eds.), *Culture and children's intelligence: Cross-cultural analysis of the WISC-III* (pp. 255–273). San Deigo: Academic Press.

Van de Vijver, F. J. R. (2004). Bias and equivalence in cross-cultural assessment: An overview. *Revue européenne de psychologie appliquée, 54,* 119–135.

Wechsler, D. (1991). *Wechsler Intelligence Scales for Children* (3rd ed.). New York: Psychological Corporation.

Wechsler, D. (2003). *Wechsler Intelligence Scales for Children* (4th ed.). San Antonio, TX: Harcourt Assessment.

Weiss, L. (2003). United States. In J. Georgas, F. J. R. van de Vijver, & D. Saklofske (Eds.), *Culture and children's intelligence: Cross-cultural analysis of the WISC-III* (pp. 41–53). San Diego: Academic Press.

Zavalishina, D. N. (2005). *Prakticheskoe myshlenie: specifika i problemy razvitija* [Practical thinking: Specificity and problems of development]. Moscow: IP RAN.

Ziegler, A. (2005). The Actiotope Model of Giftedness. In R. J. Sternberg & J. Davidson (Eds.), *Conceptions of giftedness* (2nd ed., pp. 411–436). New York: Cambridge University Press.

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[AuQ1] Please add Excellence in Cities initiative (1999) to the references.

[AuQ2] Correct that this is Renzulli et al. (2002)?

[AuQ3] Correct that here you mean Bennett, Seashore, & Wesman (1986)?

[AuQ4] It is not clear to me which reference IST (1973) refers to in the reference list. Please ensure that there is a proper reference citation for this information and that it is included in the reference list.

[AuQ5] Please add Amthauer (1973) to the references.

[AuQ6] For Genovard (1990), please provide an English translation, if possible.