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ARTICLE

Intellectual assessment of children and youth in Mexico: Past, present, and future

Pedro Sánchez-Escobedo^a, Fayne Esquivel-Ancona^b, and Liz Hollingworth^c

^aFacultad de Educación, Universidad Autónoma de Yucatán, Mérida, Yucatán, Mexico; ^bUniversidad Nacional Autónoma de México, Mexico City, Mexico; ^cUniversity of Iowa, Iowa City, Iowa, USA

ABSTRACT

The purpose of this article is to describe the history, current practices, and future directions in intellectual assessment of children and youth in Mexico. Differences and similarities with the United States are explored through the analysis of theoretical perspectives, practices, and policies. A summarized history of intellectual assessment is presented with a critical view of instruments used. Current practices, dominated by the use of the Wechsler Intelligence Scales that originated in the United States, but adapted and standardized in Mexico, contrast with the emergence of neuropsychological tests developed by Mexican scholars making efforts to dominate the field. Organizational, prescriptive, and instrumental limitations are analyzed in order to understand the many challenges and problems with the use of results from intellectual assessment in the school system. It is argued that the assessment of intellectual functioning in Mexican schools will only acquire relevance when the Mexican educational system is ready to dictate, based upon results, pathways of servicing children in effective ways.

KEYWORDS

intelligence; intellectual assessment; Mexico

For a myriad of practical and cultural reasons, the intellectual assessment of children and youth is different between the United States of America and Mexico. In particular, despite the use of similar instruments to measure intelligence, the interpretations of intelligence scores and their practical implications in the Mexican educational system are quite different. For example, intelligence testing in Mexico occurs in clinical rather than school settings. What is more, there are major differences in federal educational policy and school management that affect how intelligence tests are administered and interpreted in the two countries.

Past: History of intelligence testing in Mexico

In the early 1960s, the Terman-Merrill L-M (Terman & Merrill, 1960) scale was used to assess the intellectual functioning of children from 3 to 18 years of age, mainly in clinical and health settings. Alternatively, Kohs' test (Tirapegui, 1941), using color cubes, was also used to assess children and adolescents from 6 to 20 years of age. Both tests were used to diagnose intellectual and learning disabilities. The IQ of subjects was calculated using American norms (Diz, 2012).

Reyes-Lagunes (1977) in 1965 studied the process of adapting the Wechsler Intelligence Scale for Children (WISC, published in 1949) in Mexico. She analyzed the translation of items, facility indexes, and scoring criteria in a sample of 68 primary school children and discovered influences affecting the comprehension scale, arguing biases due to cultural differences between Mexican and American children.

In 1967, standardized testing in Mexico was boosted by the establishment of the Center for Behavioral Sciences in the National University (UNAM), under the guidance of Diaz-Guerrero, who studied the personality of the Mexican students by comparing performance on the Wechsler scales between Mexican and American children (Heredia, 1993). His team carried out the first studies on the validity and reliability of the WISC in Mexico, despite the fact that American norms were used in both groups (Diaz-Guerrero, 1967).

In fact, in Mexico, intelligence testing has followed the same tradition in the use of standardized scales as in the United States, where the majority of tests were created. Particularly important in the history of intellectual assessment in Mexico has been the translation, adaptation, and standardization of the Wechsler scales.

Hence, to better understand the challenges in measuring intelligence in Mexico, it is important to bear in mind that standardization of any test for use in another cultural context requires psychometric transformations involving an adjustment of means and standard deviations of either individuals or groups, or both (Fischer, 2004). In addition, test adaptation requires verifying that translated items make sense to the responder, that they are culturally sensitive, and that procedures and settings are familiar and comfortable to the tested individual (Hambleton, Merenda, & Spielber, 2004).

In 1993, researchers from the National University (UNAM) and the Psychological Corporation adapted and standardized the Differential Aptitude Test (DAT), developing new items for verbal reasoning, language use, and spelling. Back translation was used to verify translation of the rest of the routines and a Rasch analysis established some of the psychometric properties of test (Esquivel, 2015).

Also important has been the use of behavior checklists, such as the Gessel test (Gessel, 1949), the Vineland Adaptive Behavior scale (Sparrow, Balla, & Cichetti, 1984), and the Bayley Scales of Infant and Toddler Development (Bayley, 1993). All of these instruments are translated versions from the original English tests that use American norms.

In addition to these assessments, a few other intelligence tests are used in Mexico because of their ease of use, such as Raven's Progressive Matrices (Raven, Curt, & Raven, 1996) and the Dominos Test (Anstey & Picho, 2011). Both of these are nonverbal scales that place the child in percentiles and report a rank of performance. For a while, the Spanish edition of the Kaufman K-ABC (Kaufman & Kaufman, 2008) test was used; however, its popularity decreased over time and now it is seldom used, maybe because the wording of some items was confusing and its cost high (Osorno & Segura, 2005).

In 1982, the Wechsler Intelligence Scale for Children (WISC) was revised, translated, and administered to a sample of 1,100 children in Mexico by Margarita Gomez Palacio. This scale was called the WISC-RM (Revised for Mexico). However, interesting differences were soon discovered between the American and Mexican scales. Padilla, Roll & Gomez-Palacio (1981) reported that by using American norms, scores were roughly 15 points below the expected mean for the three main domains measured. In addition, practitioners confirmed that this test tended to overestimate the IQ, perhaps due to the Flynn effect (this test was used for nearly 20 years), and maybe because of the inclusion of many children with learning difficulties in the standardization sample (Esquivel, Heredia, & Lucio, 1999). All of the above arouse suspicions about the validity, reliability, and utility of the test with

Mexican children. Furthermore, although in the United States the third edition (WISC-III) was released in 1991, this version was never published or used in Mexico.

Present: Intelligence testing in Mexico

The Wechsler Intelligence Scale for Children–Fourth Edition (WISC-IV), published in 2003 in the United States, was presented to Mexican professionals in 2007. Like the WISC-IV Hispanic, this was a comprehensive adaptation and followed recommendations and best practices put forth by the *International Guidelines for Test Use* (International Test Commission, 2001) and the *Standards for Psychological and Educational Testing* (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999).

The standardization sample for norm development consisted of 1,234 Mexican children in 11 age groups, with an average of 112 subjects per group. Participants were drawn from 12 of the 32 states in Mexico. Children with obvious physical or intellectual disabilities and those whose first language was not Spanish (i.e., Mayan, Zapotecan, Nahuatl, etc.) were excluded from the sample. The sample was stratified on age, sex, and type of school (Sánchez-Escobedo, 2007). Fina, Sánchez-Escobedo, and Hollingworth (2012) examined the psychometric characteristics of this test, and through confirmatory factor analysis and intercorrelational studies provided information on the WISC-IV. Factor loadings and correlational patterns were found to be comparable to those seen in the American versions of the test.

Similarly, the original American Wechsler Preschool and Primary Scale of Intelligence (WIPPSI) battery was translated to Spanish and used to assess Mexican children between the ages of 2 years 6 months and 7 years 7 months since 1980 using American norms, until 2012 when the Third Edition (WPPSI-III) was finally published. Adaptation and development were planned in two phases: The first was considered a national trial and comprised a sample of 1,801 children from 21 of the 32 states in Mexico. This first attempt helped to identify the ambiguous translation of certain items and to correct some artifacts in the response protocols. The actual standardization phase included 829 children from four major regions of the country, clustered in nine age-related groups and the same exclusion criteria for the WISC-IV (Sánchez-Escobedo, 2015). Norms for Mexican children are organized in 9 bands ranging from ages 2 years, 6 months to 7 years, 3 months. The WPPSI-III claims to place less emphasis on acquired knowledge than the other Wechsler tests and features shorter, more game-like activities that hold the attention of younger children. Simplified instructions and scoring procedures enhance the

ease of administration for examiners (Pearson Publishers, 2015).

To date, these scales are the most widely used instruments to assess IQ in Mexico (Prifitera, Weiss, Saklofske, & Rolfhus, 2005; Sánchez-Escobedo, 2007). As of 2016, although the fourth edition of this test is widely used in the United States, in Mexico the process of standardization of this test has not yet started.

Other intellectual assessment tests

Many scales can be purchased nowadays in Mexico and they are sometimes used in school settings. To mention some from Spain: *Matrices* (Sánchez, Santamaría, & Abad, 2015) and *Tests de Inteligencia General Niveles 1 y 2* (Cordero, Seisdedos, González, & De la Cruz, 2008). From the United States: *The Differential Ability Scale* (Elliot, Smith, & McCulloch, 2011) and the *Mayer-Salovey Emotional Intelligence Test* (Reynolds & Kamphaus, 2013). However, none of these tests have Mexican norms, and their use is not widespread in Mexico.

More recently, some neuropsychological tests developed by Mexican scholars have gained popularity to assess intellectual ability. For example, Matute's (2014) *ENI*, an extensive battery, measures various mental abilities that allows inferences about cognitive functioning; *Neuropsi* assesses attention and memory in children and adolescents (Ostrosky-Solis, Gomez, & Matute, 2012); *BANETA* aims to identify learning disabilities, sensory, motor, and dimension of readings, and can be scored online (Yañez, 2013); and *BANFE-2 (Batería de funciones ejecutivas y lóbulos frontales)* assesses cognitive and executive functioning as well as frontal lobe integrity (Flores, Ostrosky, & Lozano, 2014). These four batteries were developed and published in Mexico, have norms for the Mexican population, and provide relevant qualitative and quantitative information about the child. As a result, they are gaining recognition in their use to assess cognitive functioning.

There is an increasing use of these tests to establish the presence of intellectual disabilities and to assess brain damage in children and adolescents. However, many other professionals argue that these batteries take even longer to administer than the Wechsler scales, that scoring and interpretation is time-consuming, and, most importantly, that school psychologists tend to have more confidence in IQ scores than in other indicators of cognitive functioning.

Legal framework and testing prescriptions in Mexico

Knowing there is a lack of federal educational policies regarding how intelligence measures are to be used will

help educators to understand testing practices and major weaknesses in Mexico regarding intellectual assessment as a professional practice. In addition, the combination of tradition with peculiarities in the organizational structure and functioning of Mexican schools results in more importance being accorded to the assessment of basic reading and math abilities (called pedagogical assessment) as criteria of placement and classification than to classical intellectual assessment. Historically, in Mexico intellectual assessment has been carried out in clinical settings, so results have been used more often by clinical psychologists than school psychologists. Also, there are differences in required qualifications between the United States and Mexico regarding training and credentials to perform intellectual assessment.

Training and credentials

Most states in the United States require professionals to hold at least a master's degree to meet qualifications for intelligence test administration in the schools and to receive a credential, certification, endorsement, or license as a school psychologist, issued through a state board of education. In Mexico, federal law equates the obtaining of a college degree with the license to practice a specific professional role. This is because the Mexican higher education system follows the French model of the 18th century that organizes universities in rather specific professional fields. In fact, the typical college degree in Mexico is called *Licenciatura*, meaning "licensed to practice a professional métier."

Thus, legally, anyone holding a psychologist college degree can administer any psychological test, including intelligence scales, even in cases when no training is provided in this regard. Furthermore, test publishers will allow the purchase of tests by anyone holding a psychology college degree; but sometimes, they have ambiguous criteria for selling tests to professionals trained at a master's or doctoral level, and it is unclear which educational professionals can purchase these tests. For example, college of education graduates have better chances than graduates from teacher training schools (*escuelas normales*).

Many problems emerge from poor training regarding administering, scoring, and interpreting intelligence tests in Mexico. For instance, many psychology programs lack an effective practicum in schools or they do not involve testing. Mastering standardized tests is also limited by the high cost of the Wechsler scales, which leads students to use more basic measures of intelligence or worse, such as using false versions of the tests.

Prescriptions for intellectual assessment

Because of historical reasons mentioned above, intelligence testing in Mexico has a strong clinical influence. That is, intellectual assessment is conducted with children only when they are referred to a psychological clinical setting, very often because they present significant deficits in learning or troubled behavior in the school. Similarly, the establishment of giftedness through intellectual assessment is only carried out when double exceptionality exists or if the child is a genius.

In Mexico, the provision of psychological services, curriculum adaptations, and differentiated teaching show tremendous differences between public and private schools. Private schools usually have a counseling and psychology department or refer the child to independent services that monitor children's progress regularly and maintain continuous communications with parents. Public schools, in contrast, usually lack a psychology department or they have one on an irregular (itinerant) basis, and they lack resources to hire external support services. Thus, intellectual assessment is very difficult in Mexican public schools.

Organizational issues

As opposed to the United States, where specific regulations exist in every state to define disorders and conditions to be established (or ruled out), Mexico's federal law does not provide guidelines for intellectual assessment, listing in rather general terms the need of educational and psychological assessment in the referral and provision of special educational services. Accordingly, operation guides in many of the Mexican states list as a general function of school psychologists the administration of tests of various kinds. In some cases, they even fail to mention the use of standardized tests or specific batteries (see and compare for instance the manuals for school psychologist in Oaxaca, Jalisco, or Durango in Secretaria de Educación Pública (SEP), Mexico (2015)).

As mentioned before, intellectual assessment in the school system in Mexico is seen as a matter of decision making for special education referral and it is not used as means for planning instruction. Furthermore, ability grouping and tracking are not warranted by federal law. In the public schools, intellectual assessment is carried out by a psychologist in one of the two available special education services. The first is usually a specialized facility called Centro de Atención Múltiple (CAM) that focuses on children with disabilities. The second are units located either permanently or by days in the school called Unidad de Servicios de Apoyo a la Escuela (USAER).

In Mexico, the prevalent theoretical perspective of intellectual assessment is consistent with the *pattern of strengths and weaknesses* approach (Hale, Kaufman,

Naglieri, & Kavale, 2006). However, since there is a strong movement to use neuropsychological tests in both school and clinical settings, theoretical perspectives with strong biological influences are slowly taking over in the interpretations of findings and test results. Furthermore, it has become accepted practice in psychological assessment to conduct screening for the presence of potential medical conditions and include tests of a neurobiological nature such as the electroencephalogram (EEG) and magnetic resonance imaging (MRI).

Currently in the Mexican school system, results from intellectual assessments are interpreted with the assumption that norms and procedures are pertinent to the student. Results lead usually to five different avenues of decision, depending upon five usual diagnostic categories as follows:

1. The establishment of a learning disability, when discrepancies in verbal and nonverbal scores are significant and the child shows strength in at least one of the dimensions assessed.
2. The presence of intellectual disability, when low scores are consistent in every dimension assessed and the IQ is below 70. Evidence of poor adaptive functioning through observation, parental interview, or testing should be also provided.
3. The presence of giftedness, when the IQ score is above 130 and evidence of task commitment and creativity is provided through teacher's reports.
4. Poor school performance in the absence of disability, and the establishment of educational delay, poor educational background, or a condition of socioeconomic disadvantage. This is concluded when test scores are within normal parameters and evidence of health issues, poverty conditions, or negligence is documented.
5. The presence of another disability affecting intellectual abilities such as autistic spectrum, cerebral palsy, deafness, hypothyroidism, and so forth.

Actions according to the diagnostic category are varied and they depend upon the state, the location of the school, the resources available, the organizational structure in the school, and the capacity of the school personnel to design an intervention, provide services, and follow up the progress of the child. Unfortunately, little research has been conducted to assess the degree of effectiveness of the diagnosis and intervention on intellectual assessment in Mexico. This is not surprising in a country in which:

1. four percent of the nearly 25 million of primary school children did not complete 6th grade in



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