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How the West and East Define and Treat Autism

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Abstract

Despite the latest publication of Diagnostic and Statistical Manual of Mental Disorders-5th edition (DSM-5), there is still no universally agreed definition on autism spectrum disorder (henceforth, autism) within the context of increasing prevalence of the condition worldwide. The aim of this paper is to bring together the operating definitions of autism from the West and the East for the possibility of establishing an inclusionary conceptual definition. To do so, two main nosological systems – DSM and International Classification of Diseases (ICD) – from the West and one – Chinese Classification of Mental Disorders (CCMD; including TCM) – from the East have been examined in this paper. Hopefully, it can provide us a better understanding of the enigmatic syndromic disorder for the purpose of preparing appropriate inclusive treatment plans for individuals with autism throughout the world – West and East as well as the rest.

Keywords: autism, definition, East, nosology, treatment, West

1. Introduction

Without a clear definition of what autism is, it is difficult to know exactly what type of appropriate treatment should be provided. Hence, there are two key issues that we need to consider: (i) an operating definition of autism; and (ii) the kind of treatment that is deemed appropriate for an individual diagnosed with autism. However, these two issues are also being complicated by the different perspectives taken by professionals practicing in the West (e.g., the United States and the United Kingdom) and those practicing in the East (e.g., China and Taiwan). As a result, we have to take one more step further to examine and understand the two issues in two different categories, i.e., West and East, and at two levels, i.e., definitions and treatments. We shall begin our discussion by looking into the operating definitions of autism from the West first and then follow up with the kind of autism treatment the West is currently offering. Next, we shall turn to the East to see what operating definitions of autism it offers before going into the autism treatments that are available. By pulling together the definitions and treatments from the West and East, we shall arrive at our own inclusionary conceptual definition and treatment of autism by marrying the ideas from both sides (see Figure 1 below).

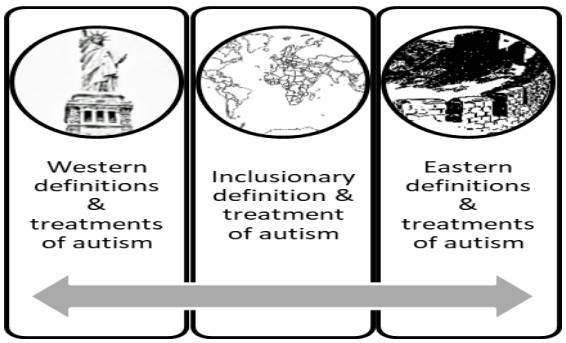

Figure 1. The 3 Strands of Definitions and Treatments of Autism

Casanova and Casanova (2018) argued that to define autism properly, we must look at the different genetic, neurological and environmental causes of as well as contributory factors to the disorder. In other words, we need to adopt a wide-ranging perspective of developmental and genetic factors and also consider the comorbidities that autism shares its relationship with other conditions, such as epilepsy, hyperlexia, alexithymia, pseudobulbar affect and aphantasia, to name just these few. Besides, rather than to treat autism as a single syndrome, there is also a need to elucidate the vast number of autism-related syndromes, such as Tuberous Sclerosis Complex (Camulli & Xie, 2020) and Russell-Silver Syndrome (Lim, Xie, & Lee, 2019), which are all too often neglected or inadequate attention is given, as autism is best understood as many different conditions. Hence, it is not an easy task for us to undertake to provide a universal operating definition of autism. However, we shall examine what the West as well as the East has to offer. We shall follow up with our own inclusionary conceptual definition of autism – not a definite one but something like work-in-progress.

In the context of autism treatment, not all treatments are effective, not all are suitable and certainly, not all evidence-based or scientifically proven. Table 1 shows examples of interventions under each of the six approaches to autism treatment. "It is better for us to take precaution and the need to inform the public, especially parents of children with autism, not to believe everything found on the social or mass media about autism treatments and/or interventions" (Chia, 2015, p. 16). At the point of writing this paper, research studies are still being conducted to evaluate the efficacy of each of the current autism treatments.

Table 1. List of Autism Treatments (Chia, 2015)

Treatment Categories	Examples of Treatment Approaches/Methods
Interpersonal Relationship Treatments	• Play-Oriented Strategies • Gentle Touching • Option Method (Son-Rise Program) • Floor Time Plan • Pet/Animal-Assisted Therapy • Relationship Development Intervention
Skills-Based Training	• Picture Exchange Communication System • Incidental Teaching • Augmentative & Alternative Communication • Applied Behavior Analysis • Task Behavior Analysis • Discrete Trial Teaching • Pivotal Response Training
Cognitive Training	• Cognitive Behavior Modification • Cognitive Learning Strategies • Social Stories • Cognitive Scripts • Cartooning
Physiological, Biological and/or Neurological Treatments	• Sensory Integration Therapy • Auditory Integration Training • Megavitamin Therapy
Interactive-and-Digital-Media Based Treatments	• Virtual Reality-Base Therapies • Game-Based Learning • Social Robots/Robot Dolls
Other Treatments and Related Agents	• Art Therapies (including Dialogic-Diagnostic Arts Therapies) • Music Therapy • Gluten-free/Casein-Free Dietary Treatment

Operating definitions of Autism from the West

In the West, especially the United States of America (USA), the operating definition of autism or ASD is based largely on the criteria provided in the Diagnostic and Statistical Manual of Mental Disorders (DSM) published by the American Psychiatric Association (APA). It is now in its fifth edition (DSM-5) published in 2013. Over the years in the history of DSM, there has been changes made in the DSM diagnostic criteria for autism (1980-2013) with an improved understanding of this complex developmental disability. Table 2 provides a brief overview on these changes (Camulli & Xie, 2020).

Table 2. Changes in the DSM Diagnostic Criteria for Autism (Camulli & Xie, 2020, pp. 12-13)

	DSM-III (1980)	**DSM-III-R (1987)**	**DSM-IV (1994) DSM-IV-TR (2000)**	**DSM-5 (2013)**
	Infantile Autism	**Autistic Disorder**	**Autistic Disorder**	**Autism Spectrum Disorder (ASD)**
Onset:	Before 30 months	Before 36 months	Before 36 months with delays or abnormal functioning in one area (social interaction, language or play)	Early developmental period; autistic symptoms may not be apparent until social demands exceed limited capacities
Deficits in communication:	Gross language development deficits	Qualitative deficits in both verbal & non-verbal communication	Qualitative deficits in communication	Persistent deficits in social interaction & communication
Deficits in socialization:	Pervasive lack of responsiveness to others	Qualitative deficits in reciprocal social interaction	Qualitative deficits in social interaction	Deficits in social-emotional reciprocity & social relationships

Over more than two decades from 1980 to 2013, the DSM has provided a good starting point to help us understand what autism is, and has also shown how its definition has been changing over that period. Briefly described, in DSM-III (APA, 1980), the onset of autism with gross deficits in language development and pervasive lack of responsiveness to others was placed before 30 months after birth. In the revised version of DSM-III (APA, 1980), the onset of autism was put before 36 months of age. It also included qualitative impairment in both verbal and non-verbal communication, and in reciprocal social interaction. With the publication of DSM-IV (APA, 1994) and its subsequent DSM-IV-TR (APA, 2004), autism is evident if a child shows delays or abnormal functioning in one area, i.e., social interaction, language or play, before the age of 36 months old, and, of course, with qualitative impairment in communication and social interaction. In DSM-5 (APA, 2013), it states that the onset of autism happens in early developmental period, but its symptoms may not appear until social demands exceed limited capacities. These problems continue to worsen with persistent deficits in social communication and social interaction as well as deficits in social-emotional reciprocity and social relationships. According to Chia, Kee, Yusof and Lim (2015), "[H]yper- or hypo-sensitivity to sensory stimuli was included in DSM-III but was omitted in DSM-IV and DSM-IV-TR. Now, it has been included again in DSM-5" (p.80).

The current diagnostic criteria for autism listed in DSM-5 (American Psychiatric Association, 2013) include the following: (1) symptoms in early developmental period (may not manifest until social demands exceed limited capacities); (2) persistent deficits in social communication and social interaction; and (3) deficits in social-emotional reciprocity and social relationships. As already

discussed earlier, with the up-dated diagnostic criteria for autism listed in DSM-5, it has extended to include a three-level support for individuals with autism depending on the degree of severity that impacts on an individual's daily functionality, ability and health.

Twelve years earlier, in 2001 the World Health Organization (WHO) launched the International Classification of Functioning, Disability and Health (ICF for short) as a **comprehensive coding system** for **functioning and disability, a conceptual framework and a "common language between all professions"** (WHO, 2001, p. 3). Its aim is to provide a standard language and a conceptual basis for the definition and measurement of health and disability including autism. Nine years later, ICF was replaced with the publication of *Measuring Health and Disability Manual for WHO Disability Assessment Schedule* (WHO-DAS 2.0) (WHO, 2010). Together with DSM-5, autism practitioners can use the WHO-DAS 2.0 manual to help them in decision-making, planning and providing appropriate and adequate support services and autism treatments at the DSM three-levels of support.

Another classification system or nosology is the International Statistical Classification of Diseases and Related Health Problems (ICD) published by the World Health Organization (WHO), now in its tenth edition. It is a medical nosological list with diagnostic codes for diseases and related health problems. Work on the tenth edition of ICD with clinical modification (ICD-10-CM; WHO, 1990) began in 1983, endorsed in 1990 by the 43rd World Health Assembly, and first used by member states in 1994 and now it is used by 117 countries. Currently, the ICD-11 development is underway and is going through a continuous revision process.

The 2020 edition of ICD-10-CM diagnostic code for autistic disorder is F84.0, which became effective on October 1, 2019 (ICD10Data.com. 2020). Its term is applicable to ASD, infantile autism, infantile psychosis and Kanner Syndrome. However, it excludes Asperger Syndrome whose previous ICD-10 diagnostic code was F84.5. According to the ICD-10-CM, autistic disorder is defined as "a disorder beginning in childhood. It is marked by the presence of markedly abnormal or impaired development in social interaction and communication and a markedly restricted repertoire of activity and interest. Manifestations of the disorder vary greatly depending on the developmental level and chronological age of the individual" (ICD10Data.com, 2020, para.6). It is "characterized by marked impairments in social interaction and communication accompanied by a pattern of repetitive, stereotyped behaviors and activities. Developmental delays in social interaction and language surface prior to age 3 years" (ICD10Data.com, 2020, para.7). Asperger Syndrome is now considered as a milder form of the autistic disorder.

According to Tyrer (2014), since the publication of DSM-III in 1980, "there has been a split between those who adhere to DSM because it is a better research classification and those who adhere to ICD because it allows more clinical discretion in making diagnoses" (p. 280).

Autism Treatment in the West

Once an individual (child, adolescent or adult) has been officially or formally diagnosed with autism by a qualified or registered autism professional, the next step is to look for an appropriate treatment that best meets the individual's needs. "The term *treatment* is used generally to cover medicine, pharmacology, psychology and education" (Chia, 2015, p. 15). According to Simpson et al. (2004), there are five broad categories of autism treatment (without any order of priority) and they are as follows:

(1) Interpersonal relationship treatments;

(2) Skills-based training programs;

(3) Cognitive training programs;

(4) Physiological/biological/neurological treatments; and

(5) Other treatments and related agents that do not fall under one of the above four categories.

With advancement made in technology, Cai et al. (2013) argued that the fifth category as proposed by Simpson et al (2004) should now be substituted with the interactive-and-digital-media (IDM) based treatments to better represent the emerging research with efforts using serious games, robotics and virtual reality technology in autism treatment. Chia (2015) placed the IDM-based treatments as fifth category

while pushing the fifth treatment category on Simpson *et al.*'s list to the sixth. In the sixth category, we recommend that complementary and alternative treatment for autism to be included. We agree with Chia's six broad categories of autism treatment (see Figure 2 below). We have also we thought of creating a separate and eighth category of autism treatment using robotics (Note 1), especially using social robots, which can interact with individuals with autism, to train them to elicit specific, desirable behaviors, encourage or motivate them, and to provide positive feedback when a given task is accomplished successfully (Cabibihan et al., 2013). However, there is a need to do two things: first, to create a comprehensive user-centered/robot social engagement (URSE) model; and second, to establish a set of formal guidelines on using robots to socially engage people with autism (see Chia & Ng, 2016, for detail).

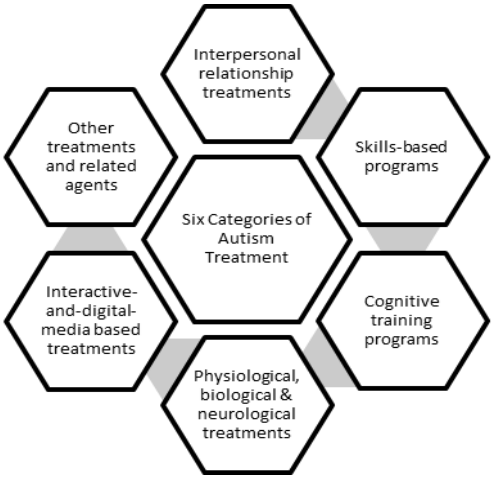

Figure 2. The Six Categories of Autism Treatment

In the West, autism treatments come in all shapes and sizes. There are many different approaches and methods. The key difference between approach and method is that the former concerns how or the way to work with someone with autism, while the latter refers to what or the process in managing or solving any issue or problem pertaining to autism. The how and what can make things more complicated for parents as well as therapists to decide what is the best treatment program for individuals with autism. There are far too many treatments (see Table 1; List of Autism Treatments) in the market claiming to be the cutting-edge therapies for autism, and Siri and Lyons (2011) have listed 66 of them for the period between 2011-2012. There are certainly even more now than before.

Many parents with children with autism are often too quick to seek miracle remedies and unproven so-called therapies when they see little or no progress achieved after undergoing conventional autism treatments. Such quackery treatments "have encouraged unhealthy, unrealistic, and improbable expectations and have, in all too many cases, retarded the progress of students with ASD" (Simpson, 2005, p. 141). Perhaps the best solution, as recommended by Shavelson and Towne (2002), to tackle such a challenging dilemma is to use science-oriented approach to differentiate those autism treatments that are scientifically proven and evidence-based from those that are based mainly on anecdotal reports and unsubstantiated claims.

Simpson et al. (2004) have come up with four levels of scientifically based or research-based evidence to classify the different autism treatments as follows:

(1) Scientifically-based practice: This is the first level of practice that involves significantly rigorous research studies done to show repeatedly and consistently similar findings that support the autism treatment concerned. Examples of these scientifically based treatments include the category of skills-based training programs, such as applied behavior analysis, discrete trial teaching and pivotal response training. Another example of scientifically supported autism treatment under the category of

cognitive training programs is the Learning Experience as Alternative Program for Preschoolers and Parents (LEAP) (Boyd et al., 2014).

(2) Promising practice: This is the second level of practice. It refers to autism treatments that are "without any or with few adverse outcomes" (Simpson et al., 2004, p.11). They have been used for many years and individuals with autism having undergone these treatments are showing favorable responses. However, these autism treatments are still currently being studied to establish their efficacy or if they are indeed scientifically based. One example is the interpersonal relationship treatment which involves play-oriented strategies. These strategies have been found to be a promising approach to socially engage children with autism. However, when such strategies are applied, the socio-cultural contexts, which these children with autism are in, must be taken into consideration. Two examples of promising autism treatments in the category of skill-based training programs are Treatment and Education of Autistic and related Communication handicapped Children (TEACCH) (Schopler & Van Bourgondien, 1991), and Picture Exchange Communication System (PECS) (Frost, 2002). Two promising autism treatments in the category of cognitive training programs include cognitive behavioral modification and social stories. The sensory integration therapy is another good example of a promising autism treatment in the category of physiological, biological and neurological treatments. In the category of IDM-based treatments, two promising autism treatments are virtual-reality based intervention programs and game-based learning (Cai et al., 2013).

(3) Limited supporting evidence-based practice: This is the third level of practice, where little or limited research has been done to study the efficacies of these autism treatments. It also includes those autism treatments whose results or outcomes are ranging from poor to slightly favorable. There are many different autism treatments across the six categories. These include the following: option method (Son-Rise™ Program) (Williams, 2006), pet/animal-assisted therapies (Pavlides, 2008), Fast ForWord program (Strong et al., 2011), cartooning (Rogers & Myles, 2001), cognitive scripts (Volden & Johnston, 1999), megavitamin therapy (Smith & Antolovich, 2000), art therapy (Martin, 2009), gluten-free/casein-free diet (Elder, 2008), and music therapy (Reschke-Hernández, 2011).

(4) Not recommended practice: This fourth level of practice refers to autism treatments that have undergone a substantial amount of rigorous research. However, the only issue is that the evidence shows without doubt the lack of favorable results or outcomes. Moreover, there have been reported "serious detrimental effects and outcomes for those who have used them" (Chia, 2015, p. 17). Two good examples are the holding therapy (Welch & Chaput, 1988) and the Facilitated Communication method (Biklen, 1993) that should not be continued in autism treatment.

Today, with a wide range of autism treatments offering various biomedical, educational, developmental or behavioral methods and strategies readily available in the market, the research over recent years has shifted to focus on brief measures that can be used to assess the general progress of individuals with autism undergoing any forms of autism treatment over time (Magiati et al., 2011). One example of such a brief measure is the Autism Treatment Evaluation Checklist (ATEC; Rimland & Edelson, 1999). It is used as part of a comprehensive assessment battery to monitor the progress of individuals with autism (mainly children and adolescents) undergoing any intervention programs to treat their condition. Parents can also use ATEC to monitor and evaluate if their children with autism are making progress with the current treatment over a period of time and if it is still suitable and adequate for them or they may want to reconsider another autism treatment after consulting a professional for advice and assistance.

Operating Definitions of Autism from the East

Looking toward East, researchers (e.g., Cai et al., 2015; Sobrino, 2015; Xie, 2019a) have examined the Traditional Chinese Medicine (TCM) records to find out if any symptoms of autism had ever been mentioned. The term autism in the Western medical sense does not exist in TCM. In fact, TCM views autism within the framework of energy balance based on the yin/yang theory (Pacific College of Health and Science/PCHS, 2014).

According to Xie (2019a), "[M]ore than 2000 years ago, the spectral symptoms of autism have already been treated in the ancient China. TCM books on prescriptions for treating the autistic symptoms

increased tremendously from Song to Qing dynasty with the total numbers of TCM prescriptions perked during the Ming dynasty" (p. 98). As mentioned earlier in this paper, what have been found in the TCM literature are "symptoms associated with autism, such as dullness, mutistic, soliloquy, five kinds of retardation, five weaknesses, fetal toxicity and infantile metopism, could be found in its records" (Cai et al., 2015, p. 21). However, according to the US-based Pacific College of Health and Science (PCHS; 2014), the term syndrome of five delays (S5D) – (i) standing, (ii) walking, (iii) hair growth, (iv) teeth eruption, and (v) speech – is used to describe these classical autistic traits observed in TCM as an imbalance of bodily functions (see Figure 3).

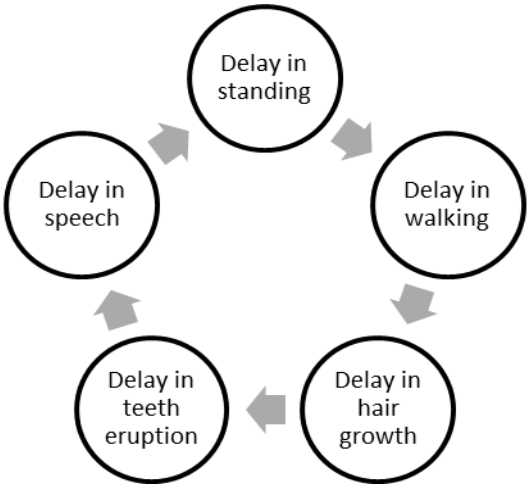

Figure 3. Autism – the Syndrome of Five-Delays (PCHS, 2014)

According to Sun et al. (2019), "[A]utism was first mentioned in Western cultures, and only later recognized in Asian countries" (p. 1; also see Sun & Allison, 2009, for detail). As the autism population prevalence increases in Asia, many countries in this region begin to take a serious view that something has to be done to address the problem before it grows out of control.

In South-east Asia, with the prevalence of autism on the rapid increase, five member countries of the Association of South-East Asian Nations (ASEAN) – Brunei Darussalam, Myanmar, Philippines, Vietnam, and Thailand – came together to establish an autism network in the ASEAN region, and the ASEAN Autism Network (AAN) was founded in 2010. The ANN sets to be a platform to engage and empower parent support groups and self-help organizations to work for an autism-friendly ASEAN region.

Among the ASEAN countries, Singapore, being a Chinese-majority city state with a population of 5.7 million, reported 1% of its population with autism. According to the Autism Resource Centre in Singapore (cited in Jones, 2016), that 1% provides an estimated number of 50,000 people with autism or a ratio of 1:114. Out of this number, 11,500 of them are under the age of 19. "Additionally, it is also reported that over 200 new cases of autism are being diagnosed annually" (Jones, 2016, para. 2).

Just north of Singapore is Malaysia. Malaysia does not have any official registry for the number of children with autism (See, 2012). "This is partly because autism is categorized under learning disabilities along with other cognitive and developmental disabilities" (Neik et al., 2014, p. 83). However, a local survey conducted revealed a ratio of 1:625 Malaysian children has autism (Azizan, 2008). The National Autism Society of Malaysia (NASOM) (n.d.) reported that based on the CDC ratio of 1:68, "approximate 9,000 children are born with autism each year" (para. 2).

In East Asia, South Korea reported an autism prevalence of 264 per 10,000 in its general population and 189 per 10,000 (95% Confidence Level 143-236) in mainstream schools (Kim et al., 2011), while Japan reported a prevalence rate of autism as 0.04% to 0.05%, but Sugiyama and Abe (1989) in their

study found a higher prevalence of 0.16%. Several years later, a study conducted by Honda et al. (2005) reported that the c**umulative incidence of** up to age 5 years (calculated for **autism** among a birth cohort from four successive years from 1988 to 1991) showed that the c**umulative incidence of autism** was 27.**2** per 10 000, with c**umulative** incidences by sex were 38.4 per 10 000 in males, and 15.5 per 10 000 in females. In other words, the male: female ratio was **2**.5:1. The more recent study done by Kawamura, Takahashi, and Ishii (2008) reported that the prevalence of autism, based on the DSM-IV criteria, was 1.81% from 1994 to 1996. "There was a substantial increase from the prevalence rate of 0.16% in 1981" (Fujiwara, Okuyama, & Funahashi, 2011, p. 584). In Taiwan, Chien et al. (2011) reported an annual incidence of autism rose from 0.91 to 4.41 per 10 000 per year from 1997 to 2005.

In China, a systematic review done by Sun et al. (2013) indicated that the prevalence of autism in the mainland as well as Hong Kong and Taiwan indicated 26.6 per 10,000. In the mainland of China alone, Wang et al. (2018) reported that the amalgamated prevalence of autism was 39.23 per 10,000, which, according to Sun et al. (2019), "is significantly lower than the estimates from the West" (p. 2). Sun et al. (2019) argued that, in spite of the fact that 75 percent of the autism cases does not have intellectual disability (Baio et al., 2018; Sun et al., 2013) most prevalence studies of autism done in China have chosen to focus on one autism subtype: children with autism and intellectual disability. Those with autism but without intellectual disability as well as those diagnosed with Asperger syndrome were excluded from these studies. However, in the most recent prevalence study done by Sun et al. (2019), the findings based on the data collected from Jilin, Shenzhen and Jiamusi cities indicated that the autism prevalence in China is comparable to Western prevalence.

In the Chinese literature on autism (e.g., Hsiao & Magyar, 2006; Tang & Bie, 2016; Wong, 2009), two terms have been used to describe the condition of autism: *zibizheng* and *guduzheng*. The former is typically known as autistic disorder commonly used in China, Malaysia, Singapore and Taiwan, while the latter is literally referred to as "lonely" disease. "Though both terms are used interchangeably to mean the same condition, a closer examination of the autistic traits actually show a subtle difference between the two conditions though they look similar" (Xie, 2019a, p. 98). Xie (2019b) has differentiated between the two conditions, stating that *zibizheng* "is often regarded as autistic disorder with more aggressive or hyperactive behavior" (slide 4), while *guduzheng* "is more of sedentary disposition and most of them with this condition are non-verbal (higher possibility of having verbal auditory agnosia)" (slide 4). Xie (2019a) regards *guduzheng* to be autistic introversion (of more passive form of autistic personality) and *zibizheng* to be autistic extroversion (of more active or aggressive form of autistic personality) (see Figure 4 below).

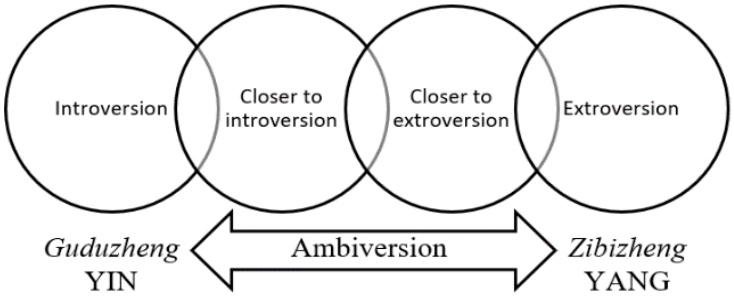

Figure 4. Application of Yin-Yang Model of Dualism in Autism Spectrum (Xie, 2019a)

Xie (2019a) used the eight TCM principles (Han, 2014) and applied in the autism diagnosis and treatment. The symptoms of *guduzheng* and *zibizheng* are better understood by applying the *yin-yang* model of dualism (Shen-Nong, 2009), where the *yin* concerns interior, cold and deficiency traits and the *yang* concerns exterior, heat and excess traits (see Table 3). According to Han (2014), the basic traits of *yin* are "passive, descending, internal, has a form, cold, dark, suppresses, yielding" (p. 2), while the basic traits of yang are "active, rising, external, formless, warm, bright, stimulates, firm" (p. 2).

Table 3. Yin-Yang Model of Dualism in Understanding Autism (Xie, 2019a)

	Guduzheng	Zibizheng
Basic Traits	Passive, descending, internal, has a form, cold, dark, suppresses, yielding	Active, rising, external, formless, warm, bright, stimulates, firm
Principles	Yin: This consists of three traits (i.e., interior, cold and deficiency) Interior: Once a condition invades the interior, it means the condition has become serious. Cold: The symptoms include cold limbs, clear urine and pallor. Deficiency: This is marked by deficiency in *qi* and blood, a weak constitution, loss of weight, giddy spells, etc.	Yang: This consists of three traits (i.e., exterior, heat and excess) Exterior: A condition at the exterior stage is trifling and is easily treated. Heat: The symptoms include a flushed face, warm body, high irritability and constipation. Excess: This is marked by symptoms (e.g., rapid breathing, irritability and constipation
Autistic Types	Autistic introversion	Autistic extroversion

In Mainland China, the Chinese Society of Psychiatry (CSP) has published its official Chinese Classification of Mental Disorders (CCMD) – an equivalent of DSM to provide an ethnomedical classification system or nosology grounded in both symptomatology and etiology (see Lee, 1996, for detail) – that has been widely used by the Chinese psychiatrists and psychologists as well as other allied professionals. The Chinese version of diagnostic manual seeks to conform with the international classification systems such as DSM and ICD on the one hand, and to sustain a nosology with Chinese cultural traits on the other (see Lee, 1996, for detail). Lee (1996) argued that despite broad similarities between the ICD-10 (WHO, 1990) and CCMD-2-R (Chinese Society of Psychiatry, 1995) on the diagnostic terms or criteria used, their blending was legitimately incomplete. Like the DSM diagnostic criteria for autism, the Chinese professionals use CCMD to provide the diagnostic criteria for screening and identification of autism. In a close examination of the criteria used in both CCMD and DSM, the Chinese diagnostic manual "categorizes autism as a childhood psychiatric condition, the diagnostic domains of which were similar to those in the Diagnostic Statistical Manual of Mental Disorders and the International Classification of Diseases" (Sun et al., 2013, p. 2).

From 1993 with the publication of CCMD-2 (Chinese Society of Psychiatry, 1993), there were 5 diagnostic criteria used to identify autism:

(1) the onset is generally by three years old;

(2) two out of five symptoms related to the impairments in social interaction;

(3) two out of five symptoms related to the language impairments;

(4) two out of six symptoms related to peculiar interests or activities; and

(5) the diagnosis of autism excludes childhood schizophrenia, Asperger Syndrome, Heller Syndrome and Rett's Syndrome.

Later, the CCMD-2 was revised with the publication of CCMD-2-R. According to Lee (1996), it included new "additions (e.g., travelling psychosis, qigong induced mental disorders), deletions (e.g., somatoform disorders, pathological gambling, a number of personality and sexual disorders), retentions (e.g., unipolar mania, neurosis, hysteria, homosexuality), and variations (e.g., depressive neurosis, neurasthenia) reveal not only the changing notions of illness but also the shifting social realities in contemporary China" (p. 421). The CCMD-2-R was eventually replaced with the publication of CCMD-3 (Chinese Society of Psychiatry, 2001).

According to Chen (2002), from 1996 to 2000, the CCMD-3 Task Force was actively engaged in conducting field trials in order to improve the classification and diagnostic criteria of mental disorders in China. In addition, the task force also included the Treatment and Nursing of Mental Disorders Relevant to CCMD-3, and the Rating Test for Health Problems and Diseases as a set of relevant

diagnostic scales and software. The entire project involved 114 psychiatrists from 41 mental health centers and psychiatric hospitals in China. According to Chen (2002), during the initial drafting phase of the CCMD document, items listed in the yet-to-be-published CCMD-3 were compared with the corresponding items in the previous CCMD-2R (CSP, 1995) as well as the descriptive definitions that were based on the clinical descriptions and diagnostic guidelines of ICD-10 (WHO, 1990). The diagnostic criteria used in the pre-published CCMD-3 also referred to the Research Criteria of ICD-10, and the DSM-IV.

According to Sun et al. (2012), the terms used in China for autism include autism, autistic disorder/childhood autism or autism tendency. In CCMD-3, the term childhood autism is used and it is defined as "one of the pervasive developmental disorders, more common in boys with early childhood onset. Individuals with childhood autism manifest impairments in social impairments in social communication, circumscribed interests and stereotyped behaviors. Approximately three quarters of affected children have obvious mental retardation, and some children show special talents although their intelligence are generally below the average" (cited in Sun et al., 2013). The CCMD-3 diagnostic criteria for childhood autism requires at least seven items in three categories of key symptoms, of which at least two items in Category 1, and at least one item each in Category 2 and 3, with an exclusionary criterion that does not include Asperger Syndrome, Heller Syndrome, Rett Syndrome, specific receptive language impairment, and childhood schizophrenia:

(1) Category I: there are two sub-categories (see I.A. and I.B below):

(I.A) two out of six items under the impairments in social interaction; and

(I.B) one out of five items under the impairments in verbal communication, mainly in the functional usage of language.

(2) Category II: Severity of impairments in social interaction.

(3) Category III: Onset of childhood autism that occurs before 36 months old.

Like the West, China has also been making progress in research on both neuroscience and autism genetics. The aim of research in autism genetics is to establish the origin of autism that could be caused by **disruptions in normal brain growth** very early in development, such as an increased rate of brain growth from early infancy (2-3 years old) through preschool period, especially in the Frontal Lobe and particularly in the dorsolateral Pre-Frontal Cortex (Carper & Courchesne, 2005) and the abnormally slow increase in the cerebral and cerebellar volumes during late childhood, puberty and adolescence (Aylward et al., 2002). These disruptions may be the result of *de novo* mutations (Wang et al., 2016) or defects in genes, such as *NLGN3* and *NLGN4X* found in the Chinese Han population (Yu et al., 2011), that regulate brain development as well as modulate how neurons communicate with each other known as neural connectivity (Chia, Lim, & Lee, 2017).

Perhaps one recent interesting research done in autism genetics in the East is the study conducted by Wang et al. (2016) confirming the importance of *de novo* mutations in autism. It further shows that the risk genes originally identified in the European cohorts with autism (Iossifov et al., 2014; O'Roak et al., 2014) are also highly relevant in the Chinese cohort today (Guo et al., 2018; Jiao et al., 2020). Wang et al. (2016) argued that the large number of *de novo* mutations are identified in *SCN2A*, i.e., both *likely gene disruptive* (LGD) being the most severe class of *de novo* mutation (Note 2) and missense mutations (errors in proteins that affect their functions, more common but individually less harmful), confirm the significance of *de novo* missense variation that contribute to autism etiology. Other risk genes (e.g., *CHD8* and *ADNP*) may predominantly be represented by *de novo* LGD or missense events (Wang et al., 2016).

Autism Treatments in the East

According to Compton (2018), there is an estimated 13 million children and adults in China affected by autism. According to the China Disabled People's Federation (cited in Compton, 2018), autism is China's most prevalent brain development disorder.

Like the parents in the West, parents in China are also desperately seeking treatments for their children

with autism. Many of these parents have to fork out their life savings to pay for intervention or rehabilitation classes for their children with autism. Others choose to seek some kind of a miracle cure through untested herbal supplements or complementary and alternative treatments. Compton (2018) reported of one family who went so far as to seek stem cell treatment in Hong Kong, at an astronomical price that they had to pay. The use of such unproven treatments not only waste time and money, but they prey upon the emotional vulnerability of parents and caregivers, who are desperate for help to improve the lives of their children with autism (Zane, Davis, & Rosswurm, 2008).

Autism treatments include pharmacological (e.g., medication and other medical options) and non-pharmacological interventions (e.g., education, sensory integration, nutrition and dietary approaches and rehabilitation). In Taiwan, for instance, rehabilitation resources are available for autism treatment. Depending on the condition of each individual with autism as it varies greatly one from another, rehabilitation necessitates professional personnel and is time-intensive. According to Li et al. (2019), district hospitals and primary care clinics are serving more and more individuals with autism as their number increases. However, due to the financial constraints caused by overall expenditure limits, expenditure on rehabilitation resources has plateaued, preventing any increase in the utilization of rehabilitation resources. As a result of the restrictions, "the availability of services for patients with autism has decreased" (Li et al., 2019, p. 7).

Although there are many different autism treatments in the market, no specific treatments are available to address the core autistic traits. Certain behavioral therapies and pharmacological treatments have been identified for the autism management in terms of depression, hyperactivity, inattention, aggressiveness or epileptic fits. However, parents of children with autism are often very concerned about potential adverse drug effects (Ahemaitijiang et al., 2020) and prefer treatments that are safe or more secure (Bang et al., 2017). As a result, it has been reported that over the last 40 years, there is an increase in the use of complementary and alternative medicine (CAM) in the East, e.g., Yamashita, Tsukayama and Sugishita (2002) reported 76% of Japanese use CAM, and in Singapore, Lim et al. (2005) reported a prevalence of between 76% and 81% of Singaporeans using CAM. A survey study done in Singapore by Chia and Kee (2013) showed that 78% of parents indicated their dissatisfaction with the current conventional treatments; 66.2% felt there were fewer negative side effects using CAM; and 75.4% saw better treatment outcomes. In addition, 93.8% of the parents believed that CAM is more natural and therefore safer and 96.9% reported that CAM practitioners are more approachable (Chia & Kee, 2013, p. 57). The World Health Organization (2002) estimated 80% of the populations worldwide depend on CAM.

Most Chinese parents believe herbal medicines as autism treatment have fewer adverse effects. Cai et al. (2015) did a review of herbal medicines and reported that 32 kinds of Chinese herbal medicine produce positive pharmacological effects, mainly in immune system improvement, memory enhancement, gastrointestinal tract improvement, and calming of the nerves. However, the study did not provide evidence on its efficacy as an autism treatment. Acupuncture (Lee et al., 2012; Ming et al., 2012) is also commonly used in the autism treatment. A systematic review on CAM for autism treatment done by Brondino et al. (2015) reported promising results for acupuncture, massage, music therapy, and sensory integration therapy. In fact, Ming et al. (2012) reported children with autism treated with acupuncture showed behavioral and developmental improvements.

The China's State Council (also referred to as the **Central** People's **Government)** has begun to prioritize autism care (Compton, 2018). In November 2017, the Chinese Ministry of Health provided 32 million yuan ($5 million US) in funding for China's first national survey of autism prevalence. In June 2018, a new Beijing program was rolled out "to cover the complete costs of early childhood education for children with autism up to age 6" (Compton, 2018, para. 17). According to Clark, Zhou and Du (2019), some local governments have recently increased funding to families caring for a child with autism, but most have not yet done so. Though these developments are quite encouraging, the future of the majority of individuals with autism remain bleak in China. Compton (2018) explained that "[P]art of the reason is a deeply entrenched system that, for the most part, puts quality autism care out of reach for all but the most privileged Chinese" (para. 18).

An Inclusionary Conceptual Definition for Autism

Adapted from the abovementioned operating definitions of autism from the West and East, Chia and Yang (2021) have constructed an inclusionary conceptual definition using four intersecting axes within a given societal context as discussed briefly below.

- Axis I: Pervasive developmental disorders (PDD), be they idiopathic/essential or complex/syndromic, as opposed to specific developmental disorders, constitute a group of disorders characterized by developmental delays in multiple basic functions including socialization and communication. PDD ranges from autistic introvert through autistic ambivert to autistic extrovert.

- Axis II: Personality disorders (PD), ranging from borderline to profound level of severity, is characterized by distorted thinking, problematic emotional responses, over-/under-regulated impulse control, and interpersonal difficulties that constitute in various ways to form **ten specific personality disorders identified in** DSM-5 (APA, 2013). Several studies (e.g., Chabrol & Raynal, 2018; Dudas et al., 2017; Lugnegard et al., 2011) have attempted to investigate the overlap between autism and PD, especially when the co-occurrence of ASD and borderline PD has been found to link to an increased suicidality (Chabrol & Raynal, 2018).

- Axis III: Emotional regulation disorder (or emotional dysregulation) is a person's inability to modulate emotional responses to provocative stimuli. It ranges from rejection sensitive dysphoria to recognition responsive euphoria. Emotional regulation is a complex process involving initiation, inhibition, and modulation of one's mental state and behavior in response to an external/internal stimulus. For instance, an unpleasant event provokes a subjective experience that results in unhealthy ruminating behavior.

- Axis IV: Inattention and disruption – commonly known as attention deficit-hyperactivity disorder (ADHD) – constitute a neurodevelopmental disorder characterized by inattention, overactivity, and impulsiveness without regards to consequences. It ranges from ADHD-Inattention subtype to ADHD-Hyperactivity-Impulsivity subtype with ADHD-Combined subtype in between. Diagram 1 presents the conceptual framework of autism that includes the four axes within a societal context.

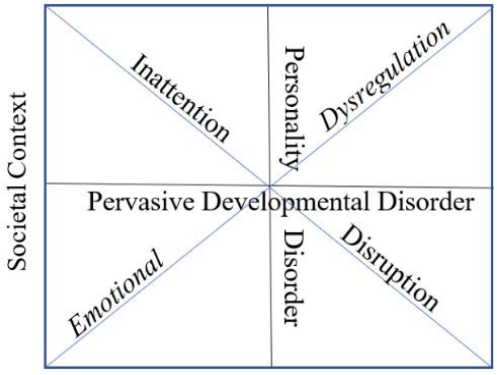

Figure 5. Autism as Defined by Four Intersecting Axes

An Inclusive Treatment for Autism

In December 2006, the 43rd President of the United States, George W. Bush, signed the Combating Autism Act (also known as Public Law 109-416) with the following statement he made: "For the millions of Americans whose lives are affected by autism, today is a day of hope. The Combating Autism Act of 2006 will increase public awareness about this disorder and provide enhanced federal support for autism research and treatment. By creating a national education program for doctors and the public about autism, this legislation will help more people recognize the symptoms of autism. This will lead to early identification and intervention, which is critical for children with autism. I am proud to

sign this bill into law and confident that it will serve as an important foundation for our Nation's efforts to find a cure for autism" (The White House, 2006, para. 1). This decision is an indication of the American determination to be pro-active in doing some serious work in autism research to provide proper autism treatment to their people, young and old.

The Act is a formal declaration of war on the epidemic of autism (O'Keefe, 2006) and it aims to enhance research, surveillance and education concerning autism, as follows (see The White House, 2006, for details on the Combating Autism Act):

(1) The Act authorizes research under the National Institutes of Health (NIH) to address the entire scope of autism spectrum disorder, which includes all its sub-categories;

(2) The Act authorizes regional centers of excellence for autism spectrum disorder research and epidemiology;

(3) The Act authorizes activities to increase public awareness of autism, improve the ability of health care providers to use evidence-based interventions, and increase early screening for autism. This Act empowers the Secretary of Health and Human Services to provide information on autism, to increase public awareness of the condition, to promote research into the development and validation of autism screening tools, to promote early screening of individuals at high risk for autism or rule out a diagnosis of autism, to provide evidence-based autism treatments and support services as early as applicable; and

(4) The Act calls on the Interagency Autism Coordinating Committee (IACC) to enhance information sharing of information about autism.

With the implementation of the Combating Autism Act of 2006, researchers and professionals from diverse fields of specialization, caregivers and significant others, directly or indirectly involved working with individuals with autism, have to come together, to work inclusively with one another, and to share information regardless of the approaches one adopts: inter-disciplinary, multi-disciplinary, cross-disciplinary and/or trans-disciplinary. However, the Autistic Self Advocacy Network (ASAN) has criticized the bill arguing that the "War on Autism" approach is not done in the interests of people on the autism spectrum. Instead, it has offended and alienated the autistic community. ASAN (2007) has advocated other methods to improve the quality of life of people with autism instead of trying to "cure" them of the condition.

In the United States, there are also many other independent organizations like ASAN. Many of them have been actively combating autism even before the Combating Autism Act was introduced. Most of them continue to pursue their respective areas of interest or own agendas. One good example is the now defunct Cure Autism Now (CAN) foundation founded in 1995 by Jonathan Shestack and Portia Iversen, the parents of a child with autism. The organization consisted of parents with children with autism, medical practitioners and research scientists devoted to autism research and treatment. In 1997, CAN established the Autism Genetic Resource Exchange (AGRE) providing more than $39 million in research grants and other programs. It also helped to establish Autism Treatment Network, Clinical Trials Network, and Innovative Technology for Autism (Coukell, 2006). In addition, CAN also funded education and outreach efforts. In 2007, CAN merged with Autism Speaks (founded by Bob and Suzanne Wright in 2005). Today, Autism Speaks is the largest private funder of autism research in the United States, and "is one of the world's largest autism advocacy organizations, with chapters in the United States, Canada, and the United Kingdom" (Autism Speaks, 2008, para. 2).

Another example is the Autism Research Institute founded in 1967 by Dr Bernard Rimland (b.1928-d.2006), who led many parents to believe that autism was caused by vaccines. His approach to "cure" autism known as Defeat Autism Now! (DAN!) Protocol also led many parents to undertake risky and expensive treatments. Although anecdotes from many parents claim that the DAN! Protocol "cured" their children with autism, no research evidence is available to support the claim (Rudy, 2020). "More significantly, there are many large research studies which have found that Rimland's vaccine-based theories were incorrect" (Rudy, 2020, para. 3). Since 2011, the Autism Research Institute has discontinued the DAN Protocol. Today, its focus has turned to biomedical issues related to autism. The institute also continues to support research in behavioral treatments and genetics.

Perhaps the Cooperative Research Centre for Living with Autism (Autism CRC for short), established in 2013 and based in Brisbane, Australia, is the world's first national, cooperative research effort focused on autism. It is one of the few organizations that focuses on improvement in the life quality of people with autism by empowering them to discover and use their diverse strengths and interests. It also facilitates and translates collaborative autism research across life-span, underpinned by inclusive processes and practices, which help to reduce potential anxiety normally experienced by individuals with autism (Getfield et al., 2018).

Moving from the West to East, our special focus is on China, being the most populous country in the world, that has been doing a lot to catch up with the West in autism research. China is making much progress to date with an ambitious threefold aim as briefly described below:

(1) To better understand the condition of autism better through research, e.g., brain-imaging techniques for diagnosis. In fact, according to Clark, Zhou and Du (2019), the Chinese State Council "has invested millions of yuan in an epidemiological study on autism and is participating in one of the most ambitious investigations ever conducted on the genetics of autism" (p. 135). This is a signal that autism is now a priority of China's and greater resources will be provided to ensure better and proper treatment.

(2) To develop a comprehensive set of diagnostic criteria for autism in order to provide an accurate clinical screening and examinations; and

(3) To provide greater resources "to ensure affordable treatment and appropriate educational options" (Clark, Zhou, & Du, 2019, p. 135) and also to offer "a comprehensive and moderately effective approach that includes education and training, psychotherapy, and pharmacotherapy" (Wang, Cao, & Boyland, 2019, p. 137).

Despite substantial increase in autism research to address the needs of children with autism in China, many teething problems remain in the Chinese education system, and they require the government and of other societal actors to work collaboratively. Having the largest educational system in the world, China has also introduced and implemented numerous policies to ensure all children's rights to an education, but opportunities remain limited for children with disabilities, and more so for those with severe autism (Clark, Zhou, & Du, 2019). Recent revisions to China's Regulations Educating Students with Disabilities that mandate inclusion may offer some form of help. However, Clark, Zhou and Du (2019) argued that effective inclusive education for the Chinese children with autism requires more than a policy and a desk in a classroom, it requires careful short-term as well as long-term planning and appropriate curricular design, teacher training and preparedness to work with children with autism, adequate resource allocation, and school administrative commitment.

Mitchell (2014) has proposed his formula to provide a complete coverage on inclusive education (IE) as follows: IE = V + P + 5As + S + R + L, where V is vision that requires educators' commitment at all levels of the education system to the underlying philosophy of IE and willingness to implement it; P is placement of learners with autism in an age-appropriate classroom in a mainstream school; 5As are Adapted curriculum, Adapted assessment, Adapted teaching, Acceptance of the right of learners with autism, and Access to classrooms, school facilities and resources; S is support from a team of autism professionals ; R is resources available to learners with autism; and L is leadership that "is required at all levels – government, national education departments or ministries, provincial or state departments, districts, school principals and classroom teachers" (Mitchell, 2014, p. 306). The same formula can be applied in the autism treatment to make it inclusive, whether it is to be practiced in the West or East.

The term *inclusive* can mean different things to different people. It is important to take note what it means "to be inclusive" and "being inclusive" – both terms sound similar but are actually different. "To be inclusive" is one's choice to make, but "being inclusive" concerns one's personal belief. Hence, whether someone wants "to be inclusive" or is "being inclusive", there are three levels to that and they are described as follows (Chia, 2016, pp. 142-143):

(1) Inclusivity (at the policy level): It refers to the policy of not excluding anyone on the grounds of gender, race, class, language, sexuality, disability, and so on.

(2) Inclusion (at the organizational level): It refers to an organizational practice and its goal stemmed from the sociological notion of inclusiveness.

(3) Inclusiveness (at the individual level): It refers to an individual's political actions and personal efforts but also, at the same time, the presence of inclusion practices in which people coming from different background possessing differences in age, race and ethnicity, religion, gender, nationality, upbringing, sexual orientation, and so on are socio-culturally accepted and welcomed, equally treated, and so forth through an inviting context for everyone from all backgrounds as well as giving an equal opportunity for individuals to succeed in a way that works for them. Hence, for example, in terms of inclusive teaching, it means to make room for teachers from different backgrounds (e.g., experience, training and qualification) to actually create different definitions of pedagogical success.

At this juncture, the question that is begging us to answer is whether there is any form of inclusive autism treatment (IAT) that is being practiced in both or either West or East. To answer that question, we need to define IAT. To us, IAT is an inclusive practice that recognizes the heterogeneity of individuals with autism, enabling all of them to access resources and support services, fully participate in activities of all kinds (at home, in school and/or workplace or elsewhere), demonstrate their knowledge, skills and strengths at assessment regardless of their varied levels of competence/performance, and enhance their daily living and learning experiences (adapted from the definition of inclusive practice for academics) (Equality Challenge Unit, 2013).

Inclusive practice in autism treatment or inclusive autism treatment (IAT) should involve everyone at different levels from those who are policy-makers through organizational authorities down to individuals who have their parts to play and contribute to the well-being of a child with autism and to get him/her to participate in the activities of his/her community. In other words, grandparents, parents, relatives, neighbors, teachers, principals, counselors, physicians, therapists, politicians … constitute "everyone in the community." Often an IAT should begin with the parents who must want to engage with service providers before working with their children with autism. According to Chao et al. (2018), parents of children with autism undergo five stages of coping management during the three-phase diagnostic process as follows:

(1) Pre-diagnosis phase:

a. Feeling uncertain and finding it difficult to understand the child's behavior;

b. Feeling obliged to obtain some forms of professional services;

(2) Diagnosis phase:

c. Anxiously searching for a second opinion;

d. Coming to terms with acceptance and fortitude; and

(5) Post-diagnosis phase:

e. Making further adjustment to come to terms with the child's condition.

Depending on which phase of the diagnostic process parents are at, the IAT has to be adapted to meet their needs as well as the needs of their children with autism concurrently, or at least begin working with the parents first by understanding their perspectives and concerns. When the parents feel more assured of what the IAT can and has to offer, they will feel more comfortable or are at ease to let their children undergo the treatment for their condition.

2. Conclusion

The writing of this paper has allowed us to explore and understand how the West and the East view, define and treat autism. It could have been a great benefit to the rest of the world if autism experts from the West and the East come together to collaborate their research, share their findings, agree on what constitutes the autistic condition, and discuss how they go about treating the condition inclusively. If that ever happens, the world could witness once again how through international effort can mankind successfully "defeat" autism as it had once done the same to eradicate smallpox in 1980 and rinderpest (cattle plague) in 2011.

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Notes

Note 1. At the time of writing this paper, we have decided to place robotics (especially social robots) under the category of interactive-and-digital-media based treatments.

Note 2. LGD (likely gene disruptive) has been correlated with IQ, a phenotypic characteristic associated with autism, but it is not a core feature of the condition (Buja et al., 2018).