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Applied Behavior Analysis in Autism Spectrum Disorders in China and Hong Kong

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Abstract

There is a wealth of evidence detailing the efficacy of Applied Behavior Analysis in the treatment of Autism Spectrum Disorders. However, the existing research knowledge base on the use of this intervention in this population in regions outside of the United States and Europe is far more modest. In particular, there is minimal data on the efficacy of Applied Behavior Analysis in the treatment of individuals with Autism Spectrum Disorders residing in regions of greater China (e.g., the People's Republic of China, Hong Kong). A review of the available literature pertaining to studies of local service programs and supporting policies are presented, accompanied by the discussions of clinical and research implications of applying behavior change strategies among the Autism Spectrum Disorder populations in China and Hong Kong.

Keywords: Autism; Applied Behavior Analysis (ABA); China; Hong Kong; IQ score

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Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by persistent deficits in social communication and social interaction, and restricted, repetitive patterns of behavior [1]. While there is no known cure for ASD, interventions are available, interventions that may be particularly beneficial when applied with adequate frequency and intensity. Lovaas seminal study on the use of Applied Behavior Analysis (ABA) in the treatment of ASD revealed a substantial ceiling for children with the disorder [2]. Recent research has further shown that improved social communication and social interaction, and even in some cases, increases in IQ score are possible, when behavioral interventions are applied early enough in development [3].

At present, empirical research clearly supports the use of ABA and other interventions with a behavioral foundation in the treatment of ASD [4]. These results have helped lay the foundation for treatment recommendations prescribed by professional and governmental organizations. Thus, in their treatment prescriptions, the National Institute of Neurological Disorders and Stroke emphasizes the successful outcomes found in many children with ASD who undergo behavioral intervention early in development, and further delineate the components of such intervention as structure and skill-oriented training sessions. In their recommendations, ABA is referred to specifically. In contrast, non-ABA treatments are mentioned only in reference to ancillary symptoms in the individual with ASD (e.g., medication for anxiety), or in recommendations for family members (e.g., counseling).

Nonetheless, in spite of a broad knowledge base detailing the efficacy of ABA in ASD, barriers to its use still do exist. While time and resources required for individualized ABA [5], particularly in children with significant degrees of disorder symptomatology, may be considerable, these are not the only limiting factors. Other barriers to behavioral treatment may reflect the degree of knowledge of ASD. That is, while ASD is considered to have a neurobiological/genetic etiology (reflected in the use of the term *neurodevelopmental disorder* in the latest revision of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders [1], confusion about ASD characteristics and etiologies persists in the lay population [6]. Such confusion impacts treatment choice because greater awareness of ASD in the general population has been found to correlate with a younger age at diagnosis [7]. In turn, a younger age at diagnosis contributes to trends towards earlier intervention, which is itself associated with better developmental outcomes [8].

Knowledge of ASD

Knowledge of ASD may also interact with geographic region of residence. For instance, in community samples in Western cultures, misconceptions about ASD etiology (e.g., conceptualizations based on psychodynamic conceptualizations of 'cold' parenting) are generally in the minority. However, in

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other regions, such as the People's Republic of China (referred to herein as China), misconceptions pertaining to etiology persist [9], and associated findings suggest that the prevalence of 'autism spectrum conditions' is potentially under-diagnosed and under-detected (e.g., 26.6 per 10,000 across China, Taiwan and Hong Kong [10]). With such results in mind, research into the use of empirically validated, behavioral-based interventions for ASD in this region is needed.

In order to examine trends in the use of such behaviorally-oriented treatments for ASD in China and Hong Kong, the current report investigates the results of an English-language literature review

A search on PubMed revealed 115 citations for 'behavior autism China,' and 31 citations for 'behavior autism Hong Kong' (in contrast to 3,071 such citations when 'United States' was substituted for 'China'). When the search term was narrowed to 'applied behavior analysis autism,' 60 such citations were found for the United States, but only five such citations were found when 'China' was used as a search term. Most citations from the aforementioned searches did not directly address research reports on behavioral interventions for ASD in these regions. Thus, the terms 'China' and, 'Hong Kong' were also entered into internal journal search engines for the following journals devoted to behavioral treatments: Analysis of Verbal Behavior, Behavior and Philosophy, Behavior and Social Issues, Behavior Modification, Behavioral Interventions, Behavioral Technology Today, Education and Treatment of Children, European Journal of Behavior Analysis, Journal of Applied Behavior Analysis, Journal of Behavior Therapy, Journal of Behavioral Education, Journal of Positive Behavior Interventions, Journal of the Experimental Analysis of Behavior, The Behavior Analyst Today.

All published studies using these search terms were reviewed. Additionally, in order to enable a more comprehensive analysis, reports cited within papers originally captured under the initial search terms were also reviewed for inclusion eligibility. Inclusion criteria included research took place in either China or Hong Kong, with individuals with an ASD diagnosis, with interventions with a behavioral basis (including, but not limited to, ABA). In total, only six studies specifically utilized behavioral interventions for ASD as part of an empirical report. The lack of a larger body of evidence prevents the use of statistical procedures like meta-analysis, or the use of procedures employed as part of a systematic review. Thus, the review supports the significant gap in overall research efforts of the efficiency nature of the ABA application for the autistic population in the China and Hong Kong region.

A note of interest, by and large the research published in China and Hong Kong regions tends to focus on sensory integration approaches. More specifically, interventions studies have often included (cultural specific) treatments such as needle stimulation, traditional Chinese mind-body exercises, and electro-acupuncture [11]. Regardless, there is an absence of evidence that such an approach is *contraindicated* in China and Kong. In a 'Cultural Considerations' section of the report by Wang [12], parents were described as receptive and eager to learn the behavioral strategies imparted to them, despite the western orientation and origination of the intervention (although the possibility that program components were spontaneously modified by parents was noted).

While overall, little attention has been paid to the manner in which behavioral intervention approaches may require modification for cultural acceptability; this topic has not gone completely ignored. Lau et al. found that parent training programs based on behavioral principles with Chinese immigrant families in a non-clinical/non-ASD sample were efficacious. Their suggestions for behavioral intervention modifications for use within the Chinese culture consisted simply of slowing the pace at which skill lessons are conducted, and increasing the quantity of behavioral rehearsal.

Wang et al. [13] in a report discussing positive behavior support practices, provide an in depth look at value differences across cultures, and how these may be best approached in order to implement needed behavioral supports. Among these differences are those manifested in the nature of the partnerships involved (e.g., directness and assertiveness versus maintenance of harmony), those concerning functional assessments of behavior (a focus on the future versus that of the past), and those related to the definition of meaningful life outcomes (e.g., individualism versus promotion of the family unit). While their prescription for addressing (if not directly reconciling) these differences is directed towards practitioners in the United States, these prescriptions may hold weight for practitioners regardless of ethnicity whose training has oriented them to a more western-culture paradigm perspective. They first emphasize the importance of self-awareness of one's own cultural values in conjunction with attempts to gain knowledge of other cultures. Clearly, there is room for behavioral-based intervention and ABA in the treatment of ASD in China and Hong Kong. In a recent commentary, Leaf et al. [14] argue that ABA, being a science, is progressive, and thus allows for flexibility. While not addressed explicitly in their commentary, it is suggested herein that this flexibility would allow for the use of ABA across cultures, enabling its fit into individual cultures, while still adhering to the central tenets of the intervention (e.g., empiricism, data collection).

Obstacles on ABA and ASD

It should be noted that many of the obstacles, barriers, and stresses inherent in research into the application of behaviorally-based interventions in general, and ABA in particular, to individuals with ASD, are in no way, shape, or form specific to China or Hong Kong. Concerning research in the social sciences and beyond, there may be a real implicit bias against replication studies. Recent trends in the ability to register some studies beforehand with specific peer reviewed academic publications may lessen this bias. This trend may have specific implications for attempts at replication across cultures. A rhetorical question posed by Wang [12] bears repeating when addressing this issue: 'why spend time and limited resources in 'reinventing the wheel' when the best practices and evidence-based parent training curricular are available from the developed countries…' They pose a succinct yet important response: with more research initiated by indigenous researchers in the area of intervention, more evidence will become available concerning culturally specific adaptations and modifications needed for successful outcomes.

Of note, a review of *research* reports should in no way be interpreted to suggest an absence of an ABA approach in *clinical* or *academic* contexts, in schools and centers in China and Hong Kong. This is because reports detailing the actual *use* of intervention methods for ASD in China and Hong Kong based on behavioral principles, and ABA in particular, are as common, if not more prevalent, than those reports summarized above which report on *research* in this area. Challenges notwithstanding, ABA appears to be a valued technique in China and Hong Kong, from the perspective of parents of children with ASD, and from professionals involved in the care and education of this group. With improved awareness and knowledge of ASD in China, parents of children with the disorder have increasingly recognized the importance of early intervention, and behavioral therapy [15]. This has led to a rapid and continued increase in the number of parents seeking such services. As a result, some research has focused on how this desire and need is being addressed.

ABA is generally offered at private centers for ASD in China. Zhou et al. [16], in what is likely the most comprehensive account of such centers, estimated their number at greater than 1,000. In their survey of 100 member centers of the Heart Alliance, an industry association of ASD intervention centers created by the Beijing Stars and Rain Education Institute for Autism (the preeminent center for ASD treatment in China), they found a total of 5,360 children being treated, of whom, 3,957 had received a clinical diagnosis of ASD. In 99 of these centers, ABA intervention was offered (as were sensory integration intervention in 73 of the centers, and TEACCH in 36). In these 100 centers, 73 worked with both children and their parents, 24 worked with the child only, and three worked only with parents.

In Hong Kong, as of a 2010 report by Mak and Kwok [17], approximately 30 non-governmental organizations were in existence providing supportive services to children with ASD, one (Heep Hong Society) specifically providing services oriented to individuals with ASD using a TEACCH program for children two to six years of age. Additionally, specialized university-based supports are also available [18]. However, the overwhelming majority of students with ASD in Hong Kong are educated in public schools. Only one privately funded school for ASD in Hong Kong exists, the Autism Partnership School, which provides individualized services using principles of ABA, with intensive instruction for staff and multiple levels of staff ABA expertise. Of note is that the center provides services *only* under the ABA rubric, and thus, the authors of a report on the center specifically mention services *not* provided, such as those pertaining to sensory integration.

Thus, there are specialized institutes for individuals with ASD in both China and Hong Kong, and behavioral intervention, and ABA in particular, seem to be the treatment of choice. Nonetheless, challenges remain. While these centers tend to possess some quality control procedures for providers [19] training may be problematic. In China, the empirical criteria behind the length of training in some such centers lacks an empirical rationale [19], and there are as of yet no standards for determining who exactly can provide services such as ABA in China [20]. The lack of staff training has been suggested as one of the reasons why many children with ASD in China and Hong Kong fail to make adequate progress, or exhibit significant improvements (even after receiving behavioral intervention) [21].

Perhaps most notable are issues pertaining to the availability of such services. Wong and Kwan [22] make reference to waiting lists for services in Hong Kong that may be as many as three years in duration. Costs too, are a significant concern. In China, ASD training centers tend to be run as primary schools which require payment, the majority of which must come from parents [19]. This may be among the most crucial obstacles, as Wang et al. [15] found that care for children with ASD exceeded annual total household income in nearly one-fifth of the urban households surveyed, and this ratio was even higher in rural households (1/3). Of note, behavioral therapy accounted for the largest proportion of healthcare expenses, with more than 50% of expenses directed in this manner, doubling the cost of transportation, and tripling the cost of outpatient care for these children. Similarly, costs at the Autism Partnership School in Hong Kong are over 28,000 USD annually.

Unfortunately, outside of such centers, little in the way of treatment is available. Sun et al. [23] note that in China there exists no specific intervention programs or special assistant programs in mainstream schools for children with ASD, and Huang and Wheeler [24] suggest that the typical class size in China (e.g., approximately 50 to 75 students) almost certainly puts a limit to the amount of more individualized attention and services available for a student with ASD.

On a more upbeat note, Wang et al. [15] point out that since 2006, The China Disabled Person's Federation has begun rehabilitation support programs for ASD for low income families. Thus, each family of a child with ASD may receive about 10,000 RMB annually (approximately 1,500 USD), and some municipalities may further supplement this income. They do describe the financial support from governmental agencies for children with ASD as being in a 'very early stage,' and further note that while The China Disabled Person's Federation (at the time of their report) had planned to create early intervention settings for children with ASD in 31 cities in China, few such cities were providing financial support for the families needing these services. Nonetheless, the recognition of the need for such services by governmental agencies is encouraging. Similar trends have been observed in Hong Kong as well. The Department of Education began the Integrated Education Pilot Project towards improving the availability of opportunities and social interactions of students with (and without) disabilities in mainstream schools in 1997. As a result, schools admitting students with special needs receive extra funding towards equipment, alterations for accommodation, and staff support [25], resulting in an increase of students with special needs in mainstream schools.

Of note, obstacles to behavioral intervention for ASD may also arise from parents. In China, parents may be reluctant to accept a diagnosis of ASD [23], and, in perhaps a related finding, only 20% reported that they would contact a specialist in ASD if needing help (most reported a greater probability of seeking out of a psychotherapist [9]). Interestingly, from a parent perspective, McCabe [20] found a great emphasis on the *quantity* of intervention approaches relative to their *quality*. In

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China, parents tend to look for the latest 'equipment' at centers, and a trend was detected in which all of the centers surveyed by McCabe highlighted their ability to provide instruction using all of the 'most advanced methods,' including ABA, TEACCH, Relationship Development Intervention, and sensory integration. One professional interviewed by the author suggested that parents might think that ABA is 'useless,' and a treatment whose 'time has passed, because it was an earlier method, now it's old, and maybe older things don't have much value.' A theme related to this was a tendency for parents to seek different treatments if one was not working, or not working quickly enough.

These concerns on the part of parents and providers speak to concerns that transcend cultural boundaries. Comprehensive ABA continues to be one of only two interventions classified as well-established for ASD [26]. Even its alternates are among the few approaches defined as 'probably' (e.g., individual, focused ABA for augmentative and alternative communication) or 'possibly' (comprehensive ABA classrooms) efficacious. However, any intervention in ASD is often inevitably concerned with designing an intervention for a child with comorbid impairments, and treatment is often intensive and complex. Thus, availability of well trained professionals is always a crucial issue, and professional training issues are not limited to China and Hong Kong. A descriptive survey of university programs (on-campus) pre-approved by a nonprofit agency identifying credentialing needs of individuals undergoing training towards providing ABA (Behavior Analyst Certification Board®, Inc.; BACB) identified no more than four such programs in any country outside of the United States (including one in China).

This survey highlights the need for greater advocacy in expediting the creation of such programs outside of the United States. Of greater concern is that even in regions within the United States, in which BACB-approved programs flourish, questions concerning who implements and coordinates behavior-based services may persist [27]. Furthermore, for children and adolescents with ASD who do not receive comprehensive and individualized ABA, education generally occurs in inclusive classrooms which often lack skill coverage for the effective teaching of students with the disorder, and this is the case even in special education classrooms [27]. And of course, cost is always an issue. Echoing what is found in China and Hong Kong; families in the United States are described as being in 'desperate' need of financial support in order to access services [28].

An interesting side note to this discussion concerns the ways in which China and Hong Kong, relative to the United States, might be better equipped going forward to provide services for individuals with ASD. In the report describing the Autism Partnership School in Hong Kong, the authors specifically mention the school's beneficial staff-student ratios and intensive staff training, approaches that might potentially be constrained in a budget-driven society such as the United States. They also discuss challenges in the United States owing to the inability to terminate poorly performing teachers (which occurs in the Autism Partnership School) resulting from a unionized staff.

Summary and Conclusion

In summary, there are few reports utilizing behavioral-based interventions more broadly, and Applied Behavior Analysis specifically, in China and Hong Kong, for Autism Spectrum Disorders. Nonetheless, what reports do exist, methodological limitations aside, exhibit evidence of efficacy? Limitations in the clinical use of this approach in China and Hong Kong are based in part on culture-specific barriers, but also obstacles more universal in nature. Of the available studies, the positive indications of the application of ABS are encouraging and shall inform an increasingly comprehensive and systematic investigation. The current report thus argues for more awareness and contribution to the study and treatment of ASD on the basis of behavioral principles in China and Hong Kong.

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