



## Understanding attention deficit hyperactivity disorder from social-ecological and evolutionary perspectives: Implications for an alternative psychosocial intervention for Chinese families of adolescents with ADHD

| Review

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**Abstract:** Attention deficit hyperactivity disorder (ADHD) is predominantly construed as an internal biological dysfunction and is treated by biomedical interventions in Chinese societies such as Hong Kong. This paper aims to review two alternative models for conceptualizing ADHD in Chinese contexts, namely Bronfenbrenner's social-ecological model and the evolutionary model of Jensen and colleagues. Understanding ADHD from the social-ecological and evolutionary perspectives has important implications for developing an alternative psychosocial intervention for Chinese families of adolescents with ADHD that takes the interplay between ADHD characteristics and the social as well as the physical environments into account.

**Keywords:** Attention deficit hyperactivity disorder; social-ecological theory; evolutionary theory; Chinese families; adolescents.

### 1. Introduction

Attention deficit hyperactivity disorder (ADHD) was historically conceptualized as a mental disorder primarily affecting boys in middle childhood and has only in recent decades been understood as a chronic disorder which persists into adolescence and adulthood for both sexes. Similar prevalence rates of adolescence ADHD have been reported worldwide, with a rate of about 3–4% in Western countries [1], 3.9% in Hong Kong [2] and 3.3–7.5% in Taiwan [3]. Although a general trend toward a decrease was found in the prevalence rate of ADHD during the transition from childhood to adolescence, ADHD persists into adulthood in nearly half of the children with ADHD in Chinese contexts [4]. In Hong Kong, the number of people diagnosed with ADHD has dramatically increased from 5,500 in 2007 to 12,800 in

2013 [5]. Among the total number of people affected by ADHD in 2013, 8,200 (63.8%) were aged under 15, while 2,900 (22.4%) were from 15 to 29 years old [5].

### 2. Lack of treatment options for Chinese adolescents with ADHD

The manifestation of ADHD symptoms causes the most salient changes during adolescence [6], yet treatment options for adolescents with ADHD have remained similar to those used for children, predominated by medication and behavioral interventions in the West [7] and also in Chinese societies [8–10]. Marked increases have been reported in ADHD medication use among Chinese adolescents during the last decade. For instance, the adolescent group (age 12–16) was found to have increased its ADHD medication use 25.6-fold during the

period from 2001 to 2013 in Hong Kong [11]. However, a trend towards a decrease in the medication's effectiveness with age was reported in both Western [12] and Chinese studies [13], with the effectiveness of clinical treatments being less when treating adolescents than it had been for younger patients. Although little information on the adverse effects of ADHD medication in Chinese contexts is available, studies from the West reported challenges in using stimulants to treat adolescents with ADHD, such as a potential for abuse and rebound effects [14]. A recent qualitative study pinpointed the conclusion that the treatment options for meeting the diverse needs of patients with ADHD in a Chinese context such as Hong Kong were inadequate [15].

### **3. Understanding ADHD in Chinese contexts from alternative perspectives**

With the concerns regarding the expanding total population and a high proportion of children retaining the effects of ADHD throughout their development, there is an urgent need to identify the essential components of a developmentally and contextually sensitive intervention for Chinese families of adolescents with ADHD in contemporary Chinese societies. The present paper reviews the use of the social-ecological model [16] and the evolutionary model [17] for understanding ADHD in the Chinese contexts.

### **4. The social-ecological model and Chinese families of adolescents with ADHD**

Social ecological theory attends to "influences of broader and more numerous contextual influences within a person's life, including settings and persons who do not come in direct contact with the adolescent" [18]. An ecology of human development differs from social psychology in that it considers "development-in-context" as its first prioritized concern, with attention being given to the interaction of biological and social forces [16]. This highlights the possible tremendous influences exerted by the contexts and their interactions with the biological human characteristics. According to Bronfenbrenner [16], "lying at the very core of an ecological orientation ... the study of human development is the concern with the progressive accommodation between a growing human organism and its immediate environment, and the way in which this relation is mediated by forces emanating from more remote regions in the larger physical and social milieu".

Social, cultural and institutional discourses frame social interactions and a person's understanding of his or her self. Adolescents are often exposed to increasingly diverse and complicated psychosocial environments, which, in Erikson's thesis [19], play an important role in those adolescents' appreciating, cultivating and shaping their ego. According to Erikson [19], an adolescent is "eager to be affirmed by peers, to be confirmed by teachers, and to be inspired by worth-while 'ways of life'". The development of adolescents, particularly the formation of self-identity, is not only influenced by their interactions with their families and peers, but also by the structural setting of the schools they attend and by cultural norms; even the physical environment can play a role. An adolescent could react to a profound extent when he "feel(s) that the environment is trying to deprive him too radically of all forms of expression" [19]. Rapid changes and stress in the psychosocial environment could amplify the symptoms of ADHD and the development of its comorbid disorders.

In Chinese societies, adolescents with special educational needs (SEN) such as ADHD are more vulnerable than their non-SEN counterparts to being exposed to highly stressful social contexts wherein students with SEN may be more vulnerable to suffering from self-deprecation and stagnation in family development.

Schooling systems in Chinese society are academically highly competitive and selective. Adolescents with ADHD are usually academic underachievers who are vulnerable to becoming unwelcome and excluded by the Chinese schooling system; low academic achievers usually experience weaker upward mobility on the social ladder in a knowledge-based economic society. A Taiwanese study [20] revealed that ADHD is one of the mental health problems among Chinese adolescents that is significantly associated with various types of school bullying, including being the victim as well as the perpetrator. Violations of social expectations are less acceptable in Chinese culture. Chinese adolescents with ADHD may exhibit behavior that challenges the social norms, and therefore they may be more strongly and more frequently rejected by those who want to maintain their group's harmony [21]. The ADHD label has a stigmatizing effect in Chinese society [22], and this negative reputation develops quickly within peer groups. Once established, it is hard to dispel [23], making it difficult for these young people with ADHD to develop stable and positive peer relationships.

Cultural expectations of parenting, such as “a father should educate his child and be responsible for his faults (養不教, 父之過)” [24], constitute a parental-blaming discourse so that any “disordered” behavior or socially unsatisfactory performance exhibited by their children would create embarrassment and bring shame to the family name. Rigid communication and relational patterns may then develop in these Chinese families of adolescents with ADHD, and major family tasks become organized around “fighting” against ADHD for the sake of enhancing their children’s academic performance. This Chinese socio-cultural force - “learning is the noblest of human pursuits” - does not only drive the parent-adolescent relationship toward tension, but it also constructs the ways adolescents with ADHD view themselves and limits the occupational identity options for these young people.

Self-devaluation among adolescents with ADHD may occur resulting from the discriminatory social practices situated in their surrounding social ecologies. This self-devaluation may beset their exercise of agency to realize their inner potential. These adolescents with ADHD and people in their immediate social ecology (i.e. family members) may need a chance to gain a new perspective on ADHD-like characteristics.

## 5. The evolutionary model and Chinese families of adolescents with ADHD

According to the evolutionary theory, every behavior or thinking style may serve certain functions that enable persons to adapt to their environments in the present or in the past [25]. From an evolutionary perspective, the “symptoms” of a disorder, that is, the emotional and behavioral responses, may in fact reflect the “adaptive responses of the organism to environmental demands” [17]. From a Darwinian perspective, the “symptoms” of a disorder must have a certain value for helping humanity to survive throughout evolutionary history [26]. Looked at from this perspective, ADHD can be understood as an adaptive response to the environment.

Evolutionary theorists have tried to hypothesize and expand the three clusters of ADHD characteristics using an alternative understanding. This may shed light on certain strengths and advantages of the ADHD characteristics (Table 1). Other proposed strengths of ADHD characteristics comprise creativity, the willingness to take risks [27], and novelty-seeking [28], which were found to have adaptive values in migratory societies [29]. An understanding of ADHD from an evolutionary perspective is not intended to rule out the explanations from other approaches, but this alternative view of ADHD could be useful in attending to the strengths innately built into these young people [17].

**Table 1.** ADHD characteristics found in the evolutionary perspective [17]

Characteristics	Strengths
Hyperactivity	Increased motor activity <ul style="list-style-type: none"> <li>● Constantly exploring the environment for threats and opportunities</li> <li>● Stimulates muscle and motor skills development</li> </ul>
Inattentiveness	Scanning and rapidly shifting attention <ul style="list-style-type: none"> <li>● Monitors dangers and threats in novel environments</li> <li>● Over-focused attention could result in a productive use of cognitive capacities and allow for future planning when environmental threats are minimal</li> </ul>
Impulsivity	Quick responses to environmental cues <ul style="list-style-type: none"> <li>● More adaptive to time-critical settings</li> <li>● More adaptive to an immediate recognition of effort</li> <li>● Individuals can learn to adjust the threshold and timing for an action based on consequences and moral thinking</li> </ul>

Humanity evolves with response to the changes in the living environment. Evolutionary theorists suggested that the living environment of our human species has evolved from unsafe to relatively safe, from impoverished to relatively rich in resources, and from time-critical for survival to relatively richer in time for future planning [17]. Young people with ADHD characteristics are quick and ready to respond so that they would likely have an advantage with respect to surviving in harsh environments [27].

Nevertheless, the contemporary school and living environment, which places great emphasis on attentional focus and has a structure of sit-and-listen, would likely be unfit for the fast-paced and novelty-seeking characteristics of young people with ADHD [17]. Under the dominant assessment discourse in Chinese secondary schools, the weaknesses of the adolescents with ADHD (or these should rather be termed “qualities that used to serve the survival of humanity”) in problem-solving, future planning and organizational skills would likely be magnified. The lack of opportunities to develop their strengths as well as their experiences of repeated failure to satisfy others’ expectations could jeopardize the pursuit of a healthy self-perception among adolescents with ADHD.

## 6. Discussion

The present paper contextualizes ADHD behavior in a modern Chinese society (Hong Kong) by applying the social-ecological and evolutionary theories. Being concerned about the contextual influences that may shape ADHD-like behavior from the social-ecological perspective and understanding ADHD as an adaptive disorder from the evolutionary perspective is not intended to oppose the use of medication and medical diagnosis. Instead, this alternative way of conceptualizing ADHD highlights the important role the social and physical contexts play in shaping the expression, interpretation and definition of the ADHD-like behavior, a role which could in turn affect the growth and development of young people with ADHD as well as the well-being of their families. This review presents a treatment implication for a shift of focus away from stressing an individual’s adaptation to the environment towards creating a favorable social context that facilitates the healthy development of young people with ADHD and their families. Apart from simply alleviating symptoms, social workers or other helping professionals in Hong Kong who work with adolescents with ADHD and their families should expand their clinical settings to areas away from the urbanized or densely-populated

areas. The outdoor and rural areas can be favorable environments that Chinese adolescents with ADHD may be able to make good use of to explore and develop themselves.

Hong Kong is a densely populated city, with over 7.4 million people living on 1,108 square-kilometres of land [30]. However, the urban areas in Hong Kong, where most of the people stay, only comprises one quarter of the total land area, whilst the remaining three quarters is countryside comprising landscapes that range from open grasslands and sandy beaches to rocky foreshores and mountain ranges [31]. Well established country park facilities have been blended into these green and rural environments for the purpose of facilitating countryside recreational activities such as walking, family picnics and camping [31].

Despite the existence of these abundant green areas adjacent to this industrialized modern city, adolescents with ADHD living in Hong Kong are often raised in a way that is disconnected from nature. Under high academic pressure, Chinese families of adolescents with ADHD often struggle with school assignments and revisions during weekends, leading to a deprivation of the needed relief from school demands, and also to a reinforcement of the deficit in the identities of Chinese adolescents with ADHD. At the same time, insufficient social support [32] and the lack of quality family time for fun [33] could keep family members in a state of high tension that disrupts the development of these families.

Working with adolescents with emotional and behavioral problems in a natural environment is a common practice in the West [34]. It has been reported that integrating individual and group therapy with challenging tasks, such as adventure recreation and outdoor living, promoted positive outcomes in these adolescents such as reducing their distress at interpersonal and intrapersonal levels [35].

Evidence from Western countries such as the United States showed that family camps in natural environments had a positive impact on the families of children with developmental disorders such as autism [36]. The first author conducted a family camp in the Hong Kong countryside for Chinese families of young people with ADHD in 2016. The feedback from the participating parents and adolescents was encouraging: the parents had experienced some quality time with their families and felt emotionally supported by others. Neither peer rejection nor bullying occurred among the young people; they explored the natural environment with curiosity and solved problems together, building up friendships instead.

Despite these potential positive results from working with families in a green and rural environment, the majority of clinical social work interventions for families of adolescents with ADHD in Hong Kong are conducted indoors and have failed to make use of the healing potential of the natural environment. Even though family camps or outdoor family day activities have been frequently adopted in Hong Kong, these services are usually offered as a one-of program for recreational purposes, whilst their therapeutic function is seldom brought into play. Adolescents with developmental disorders, such as ADHD, frequently experience a lack of day camps specially tailored to meet their needs, and many of them have previously experienced failure to be accepted or expulsion from typical camps because of stigmatization [37]. This exclusion from typical camps may further reinforce their sense of social isolation and social exclusion.

## 7. Conclusion

It is suggested that further studies need be conducted to examine and develop an alternative psychosocial intervention model for Chinese families of adolescents with ADHD that takes into account the interplay between ADHD characteristics and the social as well as the physical environments. The potential impact and helpful components resulting from connecting with the natural environment as a healing context for Chinese families of adolescents with ADHD should be carefully examined.

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## Conflict of interest

The authors declare no conflict of interest.

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