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A Study on Cold and Hot Executive Function and Theory of Mind in Children with Attention Deficit Hyperactivity Disorder

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Abstract: Attention Deficit Hyperactivity Disorder (ADHD) children are common special children in kindergartens.Understanding their specificity and deficiency in executive function and development of psychological theory is helpful to better carry out all-inclusive education. The cold and hot executive function and theory of mind of 30 groups of ADHD and normal children based on IQ and age matching were measured. The results show that: (1) the accuracy rates of inhibition control, working memory and cognitive flexibility of three sub-components of cold executive function of ADHD children are significantly lower than that of normal children, in which inhibition control is significantly different in tasks of different complexity, while working memory difference is only reflected in complex tasks related to visual space; (2) The total score of hot executive function peep behavior of ADHD children is significantly higher than that of normal children, and the level of attention allocation strategy is lower. (3) There is no significant difference between ADHD and ordinary children's psychological theory ability. In a word, ADHD children's cold and hot executive functions are significantly behind those of ordinary children, and become prominent with the increase of task complexity. Educators should consciously penetrate executive function training into all aspects of ADHD children's daily life through games and attach importance to cultivating their self-control.

Keywords: ADHD; Cold Executive Function; Hot Executive Function; Theory of Mind

1. Asking Questions

Attention Deficit Hyperactivity Disorder (Attention Deficit Hyperactivity Disorder,ADHD) is characterized by distraction, hyperactivity and impulsivity. The high prevalence of 3% to 6% makes ADHD children prevalent in kindergartens, and most of them are boys, which poses great challenges for kindergarten education. The Special Education Promotion Program (2014-2016) proposes to promote inclusive education in an all-round way, but in the face of ADHD children's sudden disruption of classroom order, attacks on others and emotional out of control, teachers often feel helpless and exhausted. Therefore, it seriously affects the implementation and implementation of the inclusive education concept.

Execution Function (EF) damage is one of the core defects of ADHD [1]. Executive function refers to the psychological process in which the cerebral cortex consciously controls individual thoughts and behaviors, such as inhibition control, working memory, cognitive flexibility, and planning. In the past, the neuropsychological measurement of EF mainly focused on the relatively abstract, de-contextualized simple cognition, so it is called cold execution function (cold EF). Miyake et al. proposed a three-factor model, pointing out that inhibition control, working memory and cognitive flexibility are the three sub-components of cold EF [2]. Research shows that ADHD and children are cold and EF have defects: among them, researchers at home and abroad have reached a preliminary consensus on ADHD and children have inhibition and control damage[3-4], but there is still no consistent conclusion on working memory and cognitive flexibility damage. Some researchers think that ADHD and childrens working memory are impaired, especially the visual space working memory[5], and their poor reading and mathematics results are related to the impairment of working memory[6]. The research found that ADHD children's cognitive flexibility also have defects[7]. However, Verté research shows that working memory problems only occur in children with dyslexia and dyslexia, and ADHD children have no impairment of working memory [8]. Corbett believes that although ADHD children have defects in inhibition and working

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memory, there are no defects in cognitive flexibility and planning [9]. A meta-analysis of 83 articles on ADHD and EF from 1996 to 2004 by Willcutt et al showed that ADHD and ordinary children had no significant inter-group differences in Wisconsin Card Sorting Test (WCST) and Stroop tasks [10]. The above differences in the assessment results of sub-component abilities of ADHD ,children cold, EF and researchers may be related to experimental tasks with mixed components and different complexity. Therefore, Rabbitt points out that the common variance of these tasks can be extracted by using multiple tasks for each structure to reduce the problem of impure tasks[11]. Therefore, in this study, the task group EF and with relatively simple tasks and complexity were used to test the three major sub-components, and the common variance and standard score were used to synthesize the total score of sub-components. In addition, visual space tasks and non-visual space tasks were distinguished in the working memory test. In addition, Mahone and others found that only the mentally retarded, ADHD and ordinary children have significant differences between groups, while the mentally equivalent or excellent, ADHD children and EF are not inferior to ordinary children[12]. For this reason, this study matched the intelligence of the two groups of children, and ensured the balance of various basic abilities among the subjects, excluding possible interference from IQ and other factors.

Executive functions involving strong emotions and motivations are known as hot executive functions (hot EF). According to sonuga-barke's dual-pathwaymodel, obvious EF damage generally occurs in complex situations where emotion, motivation and cold EF interact, so cold EF deficiency and emotional disorder can constitute different pathways to explain the general symptoms and subtypes of ADHD [13]. Hot EF has been proved to activate related brain regions (such as orbitofrontal cortex, ventral striatum and limbic system) that control emotions and the brain's "reward system", while traditional cold EF tests are more inclined to activate dorsolateral prefrontal cortex [14]. Although there may be strong connection between cold, EF, injury and ADHD, disorder, according to the two-way model, heat, EF may constitute another explanation system for ADHD and disorder. The performance of hot EF dysfunction in ADHD children is complicated, depending on whether the emotion and motivation involved play a negative or positive role in the task situation. For example, ADHD and children show obvious defects in gambling tasks with excessive motivation, which may be related to the disability of motivation adjustment or inhibition. However, when the task itself is extremely interesting (e.g. video games) or accompanied by attractive reinforcement, ADHD and children's performance are obviously improved, and appropriate motivation and emotional involvement can promote task execution [15]. In addition, the classic heat, EF and delayed gratification experiment only record the turn frequency of subjects, while for ADHD and children, it may not be accurate to refer to this index alone. Therefore, this study also includes children's actions to resist temptation during waiting as an index to compare the difference of attention allocation strategies between the two types of children.

In addition, brain imaging shows that the prefrontal lobe is the common physiological basis for EF and psychological theory [16], and the two are closely related [17]. Therefore, it is necessary to explore whether EF deficiency in ADHD children will affect their psychological theory function.Theoryofmind (ToM) refers to the ability of an individual to theory a series of mental states and external behaviors such as beliefs, intentions and emotions of himself or herself or others.Buitelaar's study showed that the performance of ADHD children in the second-level false belief task of theory of mind was significantly worse than that of ordinary children [18]. Sodian pointed out that whether there is a defect in ADHD children's psychological theory is determined by the strength of task's inhibitory ability requirement [19].Yang Juan et al. found that the performance of ADHD children on the ToM task was similar to that of ordinary children, and there was no significant difference between the two [20].Therefore, whether there is a disorder in ADHD children's psychological theory remains controversial.Since ordinary children cannot complete ToM's first-order false belief task well until they are 6 years old [21], and the second-order false belief task is too difficult for children, this study adopts the classic first-order false belief task -- accident location and accident content to test.

In conclusion, the development of cold and hot executive function and psychological theory ability of ADHD children may lag behind that of ordinary children significantly, but the research conclusions are still inconsistent. Therefore, it is necessary to control factors such as IQ, task purity and complexity and further explore.And children's cold and hot executive function and psychological theory may have a certain correlation in development, leading to mutual influence.The research on cold and hot executive function and psychological theory of ADHD children is helpful to deeply understand the psychological development characteristics of ADHD children, so as to adopt more targeted educational

methods and intervention measures to promote the development of their attention ability and reduce their hyperactivity and impulsive behavior.

2. Research Methods

2. 1 Subject

Sixty children were from 10 grade a kindergartens in Hangzhou, 30 for ADHD and 30 for general children.ADHD children were screened using the Conners child behavior inventory (teacher's questionnaire) and the diagnostic and statistical manual of neurological disorders (dsm-v) criteria.Both primary class teachers were required to score the same child in a way that met the screening criteria for adhd in both scales: at least 6 out of 9 dsm-v indicators for the assessment of distraction or hyperactivity and impulsivity for at least 6 months;The hyperactivity index score of the Conners children's behavior scale is more than twice the standard deviation of the norm average score.In the same class, the children were matched with the control group based on their scores and age on the raven standard reasoning test, and matched with the same intelligence and age difference of less than 3 months.Finally, 9 ADHD children were selected in the 4-year group, 13 ADHD children in the 5-year group, and 8 ADHD children in the 6-year group.In terms of gender, there were 23 males and 7 females in the ADHD group, and 21 males and 9 females in the general group.Intelligence ($t(29)=0.223$, $p >, 0.05$), age ($t(29)=0.341$, $p >, 0.05$), sex ratio (chi-square $(1)=0.341$, $p >, 0.05$) there was no significant difference in family background.None of the children were treated with medication, had no visual impairment or other disorders, and were right-handed.

2.2 Experimental tasks

All tasks were completed in an independent and quiet room in the kindergarten, and the total time of individual test was about 50 ~ 60 minutes.To reduce the effect of sequence effects on results, 10 tasks were randomly presented.Because the subjects were young and multi-tasking, each child completed the test in one day, taking several breaks to reduce fatigue effects.

2. 2. 1 Cold Execution Function

This experiment adopts Willoughby team's EF test tool[22]. As an improvement on the traditional method, two types of children's coldness and EF are tested by using digital page turning electronic books. The system automatically records the reaction and calculates the correct rate of each task. In order to ensure that children can fully understand the operation steps, all tasks have exercise questions. The accuracy rate of each task under the three sub-components is respectively converted into a standard Z score, the average Z score is obtained, then the data of each task under the sub-components are summarized to generate a common standard deviation, and the average Z score is inversely converted into the accuracy rate of the three sub-components after synthesis [23-24].

(1) Suppression Control Task

Silly Sound Stroop, SSS): Click on the cat when you hear the dog barking, click on the dog when you hear the cat barking, and formally test 17 Trial.

animal go/no-go (animal go/no-go, gng): there is no need to click the green button when piglets appear, and there is no need to click the green button when other small animals appear. the animals are randomly presented and formally tested 40 trial.

Space Conflict Arrows (Spatial confflict arrows, SCA): Click the left green circle with your left hand when the arrow points to the left, and click the right green circle with your right hand, when the arrow points to the right Arrow pointing and position can be divided into two situations: consistent (e.g. arrow pointing to the left and on the left circle) and inconsistent (e.g. arrow pointing to the left and on the right circle) Formal test 36 Trial.

(2) Working Memory Task

working memory span (working memory span, WMS): watching and memorizing the animal and window color information in each house on the screen within a specified time, and then reporting the animal and color seen in turn. The number of houses gradually increased from 1~3 to 9 group trials.

Self Ordered Pointing (SOP): Select unselected pictures from a group of pictures presented on the screen. Each time the picture position is selected, it will be randomly reset until all the pictures are selected. The number of pictures is

gradually increased by 2, 3, 4, and 6 sheets, and 10 trials are formally tested.

visuospatial working memory (visual spatial working memory, vwm): in the square background of 4×4 ,the squares that animals walk through and their sequence are memorized. The number of squares crossed by walking gradually increases from 2~4 to 12 group trials.

(3) Cognitive Flexibility Task

Flexible Item Selection (FIS): First practice classifying pictures according to the category of size, color ,and then test: (1) present two pictures with the same dimension, name the dimension, then present a new picture, select the one with the same dimension as the latter in the first two, and this dimension is different from the first two pictures, and formally test 20 for once; (2) Classify three simultaneous pictures with two different dimensions, and formally test 5 Group Trial.

2. 2. 2 Hot Executive Function

Using Delayed Satisfaction Task to Examine Children's Self-inhibition Control Ability. Children need to sit quietly with their backs to the gifts for one minute, and no matter what sounds they hear, they cannot turn back, otherwise they will lose the expected gifts. The whole process was secretly recorded. Two subjects recorded and scored the frequency of turning around and the actions taken to resist temptation during the waiting period. The scoring consistency was 0. 92. Every time I turn my head, 1 points, turn my head, 2 points, internal small movements, 1 points (such as closing my eyes, looking around my eyes, playing with my fingers, etc.), internal large movements, 2 points (such as kicking my leg, motioning with my hand, bending over and external large movements, 3 points (such as playing with a stool, leaving my seat and talking to the main test speaker. heat, EF and peeking are always divided into the sum of turn-around and turn-around scores, and attention allocation strategies are always divided into the sum of anti-temptation scores.

2. 2. 3 Theory of Mind

The subjects answered the questions according to the unexpected places and unexpected contents in the PPT. If the questions were answered incorrectly, the task would not get a score. If the other questions were answered correctly, the task would get a score of 1, with a full score of 2.The total psychological theory score is the sum of the score of unexpected place and unexpected content task.

Unexpected location: Xiaoli put the ball in the basket and left, then Xiaoming took the ball out of the basket and put it in the box and left, then Xiaoli came back to find the ball.

(1) Control Problem: Where was the ball before Xiaoli left? Where is the ball now?

(2) Other People's Beliefs: Where Does Xiaoli Think the Ball Is? Where will he find the ball?

Unexpected content: First the candy box appears and asks what is in it, then opens the box to present colored crayons, (1) Control Problem: What Is the Candy Box Actually Containing? (2) self-belief question: what do you think was in the box before you opened it? (3) Others' Beliefs: A child has never seen this box before. What does he think is inside?

2. 3 Data Processing

Use SPSS13. 0 Software carries out paired sample T test on ADHD and common children's cold and hot EF, Wilcoxon sign rank test on paired samples of theory of mind, and correlation analysis on three major tasks of cold, hot EF and theory of mind.

3. Results and Analysis

3. 1 ADHD and ordinary children cold and hot executive function and psychological theory differences

The accuracy rate of ADHD, children cold, EF and three major sub-component inhibition control, working memory and cognitive flexibility are significantly lower than that of ordinary children (see table 1), indicating that their cold, EF and ability are all behind that of ordinary children. Specific to each sub-task under the sub-component, inhibition and control of three complexity tasks, SSS, GNG, SCA have significant differences, while working memory only has significant differences in the most complex VWM tasks (see table 1).

Table 1 Comparison of three components of cold executive function between ADHA and ordinary children

Test type	ADHD group (N=30)		Common group (N=30)		t
	M	SD	M	SD	
Inhibitory control (Total score)	0.87	0.10	0.93	0.05	−3.33**
SSS task	0.86	0.14	0.92	0.09	−2.66*
GNG task	0.93	0.07	0.97	0.04	−2.40*
SCA task	0.82	0.17	0.90	0.09	−2.83**
Working memory (Total score)	0.71	0.09	0.75	0.09	−2.20*
WMS task	0.73	0.12	0.76	0.11	−0.97
SOP task	0.82	0.08	0.84	0.08	−1.57
VWM task	0.58	0.14	0.66	0.14	−2.20*
Cognitive flexibility (Total score) (FIS task)	0.85	0.10	0.89	0.07	−2.26*

Note: * $p<0.05$; ** $p<0.01$ The same below

The total score of peeking behavior and the score of attention disposition strategy of ADHD children are significantly higher than those of ordinary children, indicating that their self-control ability is poor, attention disposition strategy is also at a low level, and hot EF ability is defective (see Table 2).

Table 2 Comparison of ADHA and ordinary children's thermal executive function

Test type	ADHD group (N=30)		Common group (N=30)		t
	M	SD	M	SD	
breaches	1.83	2.17	0.27	0.78	3.91**
Attention allocation strategy	5.57	3.42	3.43	2.53	3.43**

ADHD and children have higher scores on accident content tasks than ordinary children, and lower scores on accident site tasks and total score of theory of mind, but there is no significant difference, indicating that there is no defect in their theoretical of mind ability as a whole (see table 3).

Table 3 Comparison of psychological theory differences between ADHA and ordinary children

Test type	ADHD group (N=30)		Common group (N=30)		z	p
	M	SD	M	SD		
Unexpected content task	0.93	0.87	0.77	0.73	−0.88	0.38
Accident site task	0.83	0.91	1.03	0.89	−1.60	0.11
Psychological theory score	1.77	1.41	1.80	1.35	−0.09	0.93

3. 2 The correlation analysis between ADHD and cold and hot executive function and psychological theory of ordinary children

3. 2. 1 ADHD Relationship with Three Sub-components of Cold Executive Function of Ordinary Children

ADHD Children's Cognitive Flexibility and Correct Rate of Inhibition Control (R = 0. 381, p=0. 038), Working Memory Accuracy (R = 0. 801, p=0. 000), the right rate of cognitive flexibility and inhibition control for ordinary children (404, p=0. 027, there is a significant correlation.

3.2. 2 The relationship between ADHD and ordinary children's cold and heat executive function

The total score of peek behavior and the correct rate of working memory of ADHD children (r=-0).572, p = 0.001), correct rate of cognitive flexibility (r=-0.550, p = 0.002), the total score of peek behavior and the correct rate of cognitive flexibility of ordinary children (r=-0.365, p = 0.047), attention allocation strategy and inhibitory control accuracy (r=-0).384, p = 0.036), were significantly correlated.

3. 2. 3 The relationship between ADHD and cold and hot executive function and psychological theory in ordinary children

ADHD and Children's Theory of Mind Accident Location and Inhibition Control Correct Rate (R = 0. 484, p=0. 007) has significant correlation, but heat EF has no significant correlation with theory of mind. Normal Children's Working Memory Accuracy and Theory of Mind Unexpected Content (R = 0. 473, p=0. 008), Unexpected Location (R = 0. 392, p=0. 032). Total score of theory of mind (r = 0. 570, p=0. 001) are significantly correlated; And hot EF is significantly related to psychological theory: total score of peeking behavior and unexpected content of psychological theory (r =-0. 370, p=0. 044), Total score of theory of mind (r =-0. 404, p=0. 027) Significant Correlation.

4. Discussion

4. 1 ADHD Children's ability of each sub-component of cold executive function lags behind that of ordinary children, and cognitive flexibility is closely related to inhibition control and Working memory

In this study, EF measurement task group was used to test three cold EF sub-components of ADHD children, and the results showed that the ability of cold EF sub-components of ADHD children was significantly lower than that of ordinary children.Among them, the correct rate of ADHD children in the inhibition and control tasks with different complexity is significantly lower than that of ordinary children, indicating that the inhibition and control defect is an important defect of their executive function, which is consistent with the research results of wen ping [25] and zhang wei et al. [26]. According to Sergeant's cognitive energy model, ADHD children suppress control defects because of their weak self-regulation ability, which makes the energy required for attention insufficient or over-activated, resulting in a slow or too fast behavioral response, resulting in inhibition failure [27]. Because most cold EF tasks need to suppress dominant responses and constantly adapt to new rules, ADHD children show more capacity than normal children in their tasks.

ADHD Children perform well in simple working memory WMS and SOP tasks and lack performance in VWM tasks. It seems that ADHD children's working memory defects mainly occur in complex memories related to visual space. Because the three working memory tasks used in this study require different cognitive resources, the first two tasks mainly measure memory capacity. ADHD children have enough attention resources to maintain information and store memory, while the latter task requires a lot of attention. The resource keeps track of the target and keeps updating the target location. In addition to examining the memory capacity, it also increases the requirement for spatial location memory. The fMRI study also showed that children with ADHD were compensated for the prefrontal lobe (attention control), the anterior cingulate anterior (regulation), and other brain regions associated with information maintenance during the visual work memory task (the temporal lobe, the auxiliary motion zone, and the top). Insufficient function of the posterior lobes and basal ganglia, etc., requires activation of more relevant brain regions around, but it is still insufficient to compensate for the function of the entire working memory neural network, thus exhibiting memory deficits [28].

The FIS task accuracy rate of ADHD children is significantly lower than that of ordinary children, suggesting that it is difficult for ADHD children to convert the old rules according to the new requirements, and there is a cognitive flexibility defect. This study also found that ADHD and children's cognitive flexibility deficits are closely related to their weak inhibitory control and working memory ability. Because when switching to a new task, attention to the old task needs to be suppressed and relevant rules of the new task need to be memorized[29]. The essence of cognitive flexibility is the ability to flexibly change the contents of working memory according to needs, including inhibition control and working memory, belonging to hybrid EF. Cognitive flexibility, as a more advanced and complex ability, develops in childhood

on the basis of inhibition and working memory[30].

Overall lag in cold EF ability in ADHD children may be related to functional impairment of prefrontal cortex.Studies have shown that the volume of cortical gray matter, such as prefrontal lobe, in ADHD patients is significantly smaller than that of normal people, and the thickness of ef-related cerebral cortex is thinner than that of normal people [31].The prefrontal lobe is involved in attention control, working memory, cognitive flexibility and planning, etc., and controls and coordinates other cortices and subcortical structures to achieve specific goals by sending top-down signals [32].People with prefrontal lobe injury have normal IQ, long-term memory, perception, motor and language abilities, but they have defects in judgment, planning, decision-making, time organization of behavior and working memory [33].

4. 2ADHD Children's Thermal Executive Function Lags Behind Ordinary Children

The delayed gratification experiment found that ADHD showed more peeking behavior than ordinary children, which indicated that ADHD had weak self-control ability and was difficult to restrain impulse. There were defects in hot EF, which was consistent with the conclusion of Li Qianqian and others [34]. Delayed gratification tasks involve more self-related emotions and motivational components, ADHD and children may not be effectively awakened or activated in reward-related motivational processing due to impairment of orbitofrontal cortex and anterior cingulate cortex, and affect behavior inhibition, response selection and self-monitoring functions[35-36]. Correlation analysis suggests that ADHD, child fever, EF and defects may also be related to poor working memory and cognitive flexibility. ADHD Children are difficult to analyze problems in a flexible and multi-representation way when facing conflicting and stimulating situations. They cannot keep in mind the rules to inhibit their motivation to see rewards urgently, and are vulnerable to stimulation control effect, which leads to behavioral decision impulse.

ADHD children's anti-temptation actions are mostly external large-scale actions (such as singing loudly, talking to the main test, leaving the seat, etc.), indicating that their attention allocation strategy development is at a low level. When ADHD children face the conflicts of waiting with reward and immediately seeing without reward, in order to obtain reward, they will selectively engage in more external activities to achieve maximum self-distraction, and reduce the aversion and frustration generated during waiting.

4.3ADHD Children's Theory of Mind Performance Normal

ADHD and theory of mind ability of ordinary children have no significant difference on the whole, which is consistent with the conclusions of Yang Juan and others[37]. This may be due to the fact that the unexpected location task needs to suppress the real position of the object[38], which is more difficult than the unexpected content task[39]. Some studies have pointed out that subjects with right prefrontal cortex damage can not pass the false belief task with high inhibition control requirements, but can well complete the task with low inhibition control requirements. ADHD children's good performance in wrong content tasks shows that they have the ability to understand wrong beliefs, while the lack of tasks in unexpected places shows that they cannot suppress their own views. In addition, this study found that ADHD children's inhibitory control ability is closely related to accident site tasks, and ordinary childrens working memory is closely related to theory of mind, which partially supports the hypothesis that cold, EF and theory of mind have common psychological components. Cold and EF can help children understand other people's thoughts and make correct responses in theoretical tasks of mind[40]. In addition, the common children's heat EF are significantly related to the theory of mind, while in ADHD children are not. It is speculated that it may be related to the functional defect of prefrontal cortex: prefrontal cortex is heat EF and brain areas shared with the theory of mind, and its damage may lead to the loss of this correlation.

5. Educational Suggestions

The progressive development pattern of executive function from preschool to adolescence shows that it has high plasticity. Based on the current situation that ADHD, cold children and the ability of thermal executive function

lags behind that of ordinary children, educators can intervene in it from the following aspects.

5. 1 Promote ADHD and Development of Children's Cold Executive Function in a Multi-channel, Playful Way

First of all, make full use of the various educational opportunities in the day-to-day life of kindergartens, and combine the characteristics of children's gamification learning to cultivate EF skills in multiple ways. For example, through outdoor sports games such as "Wooden Man" and "Writing Wang Zi", the ability to suppress and control is improved; through the "24 points", "flop" and "Lianliankan" and other scientific puzzle games to promote the development of working memory and cognitive flexibility; Improve the planning and problem-solving skills through role-playing games such as "hospitals" and "small pastry chefs" in the language and art fields. In addition, the cold EF task itself can be used for targeted training and intervention in ADHD child suppression control, working memory and cognitive flexibility [41]. Active peer interaction experience can also promote the development of cold EF in ADHD children: through observation and learning of appropriate behaviors of peers, making them more resistant to interference, management and control of their own behavior and emotions towards others, adherence to mission rules, participation in targeted group activities . Finally, it is difficult to provide tasks for ADHD children, and the application of multimedia technology to the teaching process and the formation of multi-sensory learning pathways can enrich their synaptic connections, improve brain function, and improve their cold EF capabilities.

5. 2 Promoting ADHD and Development of Children's Hot Executive Function by Improving Self-control

Self-control, as the core skill of heat ,EF and ability ,is helpful for ADHD and children to successfully complete various tasks and establish and maintain benign social relations. First of all, since cold and heat EF are closely linked, their self-control power can be improved by improving cold EF and capability Secondly, in order for ADHD and children to successfully complete their tasks, teachers and parents can stimulate their motivation to perform self-control by directly demonstrating promised rewards, and should give consideration to the balance between delayed gratification and immediate gratification. In addition, interesting teaching methods are also conducive to their motivation to start. Parent-child relationship is also closely related to children's self-regulation ability[42], warm and loving environment and parents, Teachers' lenient and strict educational methods can make them more actively and actively carry out self-regulation according to adults' requirements. At the same time, teaching strategies related to metacognitive thinking to ADHD and children, such as the concept and method of self-control, can enable them to learn to use thinking tools to regulate their own state and Strengthening self-control behavior[43]. Finally, regular and perfect classes help children internalize class management into self-management: regular training requirements in a gradual and orderly way ADHD Children can gradually improve their self-control power through willful efforts to overcome unreasonable desires and inertness.

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