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Case Study: Functional Behavior Analysis and Support Strategies for Expression of Needs Deficits in Children with Low-Verbal Autism

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Abstract: Grounded in multiple case studies of children with autism, antecedent-behavior-consequence analyses of maladaptive behaviors-including distress following ankle sprains and clothing-directed repetitive actions-are employed to reveal the functional essence of these manifestations as deficits in need communication. The etiological mechanisms contributing to such expressive deficiencies are further investigated through neurophysiological, psychological, and ecological perspectives, collectively informing the formulation of appropriate intervention strategies. Within the pedagogical context, the findings underscore the critical importance of discerning communicative intent embedded in overt behaviors, advancing individualized support frameworks, and implementing comprehensive environmental modifications to cultivate need-expression competencies and promote social inclusion. These insights aim to enrich the theoretical and empirical discourse, thereby providing a substantive reference for future research on need-expression abilities in children with autism.

Keywords: Autism, Behavioral Analysis, Case Study, Needs Expression Deficits.

1. Case Descriptions

(1) Event 1: Crying after an ankle sprain

During a physical education activity, Xiaocheng accidentally fell and sprained his ankle. However, he did not express his pain to the teacher or the accompanying parent. Instead, he continued walking on his injured leg, then threw a tantrum on the playground, shouting loudly and tearing at his own clothes. An intern teacher which unaware of the situation, tried to soothe him, whereupon Xiaocheng exhibited aggressive biting behavior.

(2) Event 2: Wetting pants

Xixi, who has language impairments, suddenly stood up 15 minutes into the Chinese language class one morning, walked a loop around the open area of the classroom, and sat back down. Shortly afterward, he stood up again, walked to the back of the classroom, circled around, and approached the front door. On his third departure from his seat, he stopped beside the teacher's podium and experienced urinary incontinence. The accompanying parent noticed and took him out of the classroom; about 5 minutes later, he returned in clean, dry clothes. After returning to his seat, Xixi no longer looked at the blackboard but repeatedly fiddled with his pencil case, taking pencils out and putting them back, and stood up and sat down twice during this period.

(3) Event 3: Crying during class

At the start of the fourth class each morning, Xiaochen would progress from soft sobbing to loud wailing, simultaneously slapping the desk with both hands and rocking his body back and forth, severely disrupting classroom instruction and causing other children to scream in response. The teacher took out a biscuit and handed it to him. Xiaochen took the biscuit and immediately stopped crying, lowering his head to eat it. The accompanying parent explained that the child often cries because of hunger.

(4) Event 4: Running around

During a math class, the teacher asked Xiaomi to come to the blackboard to solve a problem. Xiaomi walked to the blackboard, picked up a piece of chalk, and stood for about a minute without moving. He held the chalk with his hand suspended in midair. Then he suddenly turned and left the blackboard, ran rapidly back and forth in the front of the classroom swinging his arms, and emitted a high-pitched, prolonged sound. The accompanying parent rushed over upon hearing this and scolded him sternly. The teacher walked up and asked, " you don't know how to solve this problem, right?" Xiaomi nodded. The teacher then guided him through the problem together.

(5) Event 5: Tearing clothes

Xixi was sitting by the window, his face covered in sweat. He first scratched the back of his neck with his right hand, and after three or four scratches, he began pulling at his collar. The seam of the collar started to tear, and he continued pulling at the same spot until the clothing was torn apart. The parent helped him unzip the zipper and take off the jacket, whereupon he stopped pulling and sat quietly.

2. Event Analysis

Through the ABC analysis of these events, it can be seen that although these problem behaviors differ from one another, they share a common antecedent: the student is in a state of certain physiological or psychological need but lacks the ability to express it appropriately. Crying, tearing, and self-hitting are essentially alternative communication strategies for these children.

The problem behaviors exhibited by these children appear superficially unrelated, yet they collectively reveal a common antecedent – a deficit in expressing needs – which in turn leads to varying negative consequences . In Xiaochen's past experiences, the consequence of crying behavior was adult intervention and soothing, which gradually alleviated physical discomfort. However, in the present ankle-sprain incident, there was no adult nearby. He did not receive timely comfort or medical attention. The pain in his ankle persisted, so he resorted to biting others to attract attention, rather than using appropriate need-expression methods. Similarly, Xixi

could not express his discomfort after sweating; tearing at his clothing was a way to relieve stuffiness and obtain cool sensory stimulation, but it directly resulted in torn clothing. Moreover, this behavior satisfied his need through his own actions, without directly expressing or seeking help.

In summary, the problem behaviors in the above cases can be viewed as atypical communication strategies developed by children with autism to cope with environmental demands and satisfy basic needs, given their insufficient ability to express needs. Therefore, the focus of intervention for these children should not be on eliminating the problem behaviors themselves, but on enhancing their ability to express needs, enabling effective self-expression of needs, and thereby improving their self-care skills and overall quality of life.

Table 1. ABC Observation Record

Event	Antecedent (A)	Behavior (B)	Consequence (C)
1	Unable to express pain	Shouting and yelling	Aggressive behavior
2	Unable to express need to use the toilet	Repeatedly leaving seat	Incontinence, inattention
3	Unable to express hunger	Crying, slapping the table	Disrupting classroom instruction
4	Unable to solve the problem	Screaming and running	Being scolded
5	Feeling stuffy and unable to relieve it	Tearing collar	Damanged clothes

3. Mechanisms Related to Needs Expression Deficits in ASD Children

The ability to express needs is central to language communication[1]. However, the children with autism in the case studies, due to existing deficits, are not only unable to communicate with others but also exhibit varying degrees of difficulty in expressing their own intentions and engaging in communicative interaction, which in turn creates numerous obstacles for future social integration. To date, the etiology of autism spectrum disorder remains unclear. Against this background, analyzing the causes of various functional impairments in autism has become an important research direction.

Wang et al. suggest that due to impaired joint attention in children with autism, there is a dissociation in the early development of primitive imperative and primitive declarative abilities, the former being the capacity used for expressing needs. Moreover, compared with typically developing children, children with autism show delayed language development. In addition, some individuals with autism may never develop speech and exhibit limited comprehension of linguistic meaning[2]. Behaviorally, they are unable to appropriately use spoken language, sign language, or body language to express their intentions, and may even experience emotional breakdowns, loud shouting, or aggressive behaviors such as self-injury or harming caregivers and teachers. These severely affect the quality of life for both the children themselves and their caregivers, and are even more detrimental to successful social integration.

Furthermore, research indicates that the language expression ability of children with autism is influenced by the individual's level of physical and mental development, as well as by the interactions among the microsystem, mesosystem, exosystem, and macrosystem centered on the child. The mechanisms underlying their expression deficits may arise from multiple aspects, including anatomy, neurology, and psychology[3]. In the field of anatomy, scholars from New Orleans, such as Knaus et al., have shown that the severity of expressive language impairment may be related to the volume of the planum temporale (PT) in both cerebral hemispheres[4]. In neuroscience, research by Korean scholar Choi et al. suggests that fine motor skills in infants with autism between 6 and 24 months of age may influence later language expression outcomes[5]. In addition, studies by American scholar Pecukonis et al. have found that annual household income and the quantity and quality of parental language input may also play a particularly important role in the expressive language development of children with autism[6].

In summary, the formation of needs expression deficits in children with autism is not attributable to a single factor, but rather constitutes a complex and large-scale system integrating multiple elements, including physiological neurological development, psychological cognitive functions, and environmental support.

4. Support Strategies

(1) Establishing Multiple Communication Modalities

Children with autism, especially those with low or no verbal ability, possess unique potential in nonverbal communication. Scholar Ma pointed out that, compared with spoken communication, nonverbal communication is of greater significance for the development of children with autism[7]. In addition,Chen using a self-developed scale to assess children with autism, found that children with autism tend to use nonverbal means, such as body movements, more frequently to express "requests" and "refusals." Therefore, Mo Chen argue that developing diversified nonverbal communication modalities, particularly those based on physical contact, can help compensate for language deficits and promote the development of higher-level communication functions [8].

Moreover, existing studies have shown that augmentative and alternative communication (AAC) systems, such as the Picture Exchange Communication System (PECS) and speech-generating devices, can effectively improve the needs expression ability of children with autism [9][10]. At the same time, leveraging the visual learning preference of children with autism, picture cards or visual prompt cards can be used to help children like Xixi express their needs, thereby reducing emotional or problem behaviors caused by communication difficulties and improving their quality of life.

(2) Reinforcing and Consolidating Target Behaviors

Behaviorist theory emphasizes that timely reinforcement is key to shaping new behaviors. Studies have shown that combining functional communication training with delayed reinforcement can effectively improve functional communication skills in children with autism [11]. When a

child attempts to express a need using speech, picture cards, or assistive devices, teachers and parents should provide immediate positive feedback, such as using the child's preferred reinforcers, providing token rewards, or offering praise as social reinforcement.

Such reinforcing activities and items can quickly establish a connection between needs-expression behaviors and positive outcomes for children with autism, enhance their motivation to engage in functional communicative expression, and, through continuous reinforcement and consolidation, improve their ability to express needs.

(3) Adjusting Environmental Support Measures

Support from the ecological and social environment also plays an important role in the development of needs expression ability in children with autism. In terms of physical environment support, a stable and structured physical environment should be created. Classroom decorations and the placement of items should not be changed frequently. Moreover, visual schedules with simple written descriptions can be provided to remind children with autism to express discomfort by speaking or using communication cards. Teachers can also use clear and concise instructions, supplemented by gestures, facial expressions, and other nonverbal prompts, to help children understand the requirements in different situations.

At the same time, a mutually supportive and inclusive social environment should be fostered within the classroom. Peer involvement not only increases opportunities for children with autism to interact with others but also enhances their imitation and observational learning abilities. Research has shown that peer-mediated interventions can effectively improve expressive language in preschool children with autism [12]. Teachers can invite other capable children in the class to serve as little assistants, demonstrating appropriate ways to express needs for children like Xixi in natural contexts such as games and mealtimes, thereby enhancing their needs expression ability.

5. Educational Reflections and Implications

(1) Attending to the Intent Behind Problem Behaviors

For children with autism whose needs expression ability is limited, problem behaviors such as aggression, self-injury, and tantrums are often their only means of expressing needs or escaping aversive situations. Applied behavior analysis theory categorizes the functions of such problem behaviors as access, escape, and sensory stimulation, with each behavior having its corresponding antecedent.

Therefore, in the education of children with autism, educators must abandon traditional moral-judgment perspectives. Through systematic observation and assessment of behaviors, they should interpret the messages that different problem behaviors attempt to convey and identify alternative, more appropriate replacement behaviors at the root level, so that needs can be expressed in suitable and reasonable ways. Teachers and parents must look beyond the surface of behaviors and accurately grasp the communicative intent and the underlying nature of the needs behind the problem behaviors of children with autism, in order to provide scientifically sound and effective support strategies and jointly promote their healthy development.

(2) Promoting a Combination of Diversification and Individualization

Just as light waves differ in frequency across the spectrum, children with autism spectrum disorder vary greatly in their perceptions, cognitions, and expressive styles. Moreover, no single intervention approach is perfect, and no single communication method works for everyone. Therefore, it is essential to uphold the principle of diverse communication modalities.

Support providers should offer students with needs expression deficits a variety of communication tools, including the Picture Exchange Communication System, matrix communication boards, and speech-generating devices, and determine each student's current ability level through standardized assessment instruments, so as to tailor individualized educational support plans. This ensures that every student can find the most suitable way to express themselves, achieve effective communication, and meet their daily living and learning needs.

(3) Creating an Accepting and Supportive Environment

The development of needs expression ability in children with autism cannot be separated from environmental support. In terms of the physical environment, clear and structured visual prompts and easy-to-use communication tools should be provided. In terms of the interactive environment, educators and peers should actively create communication opportunities, ask questions using simple and clear language, and allow children sufficient time to respond. Prompt reinforcement should be given after children with autism respond. In addition, efforts should be made in the classroom to cultivate a class atmosphere that embraces differences, encourages attempts, and is oriented toward understanding. Through comprehensive environmental support, children with autism can gradually improve their needs expression ability and social adaptability in the process of courageous expression.

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