RESEARCH ARTICLE

DOI: 10.34256/ajir1938

ASIAN JOURNAL OF INTERDISCIPLINARY RESEARCH

A Traditional Chinese Medicine (TCM) Based Screener for Autistic Spectral Symptoms

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Received: 11-08-2019
Accepted: 06-09-2019

Abstract: Unlike most of the autism screeners that use the classical triad of impairments in social interaction, communication and stereotyped behaviors to identify autism, the present screener is based on the yin-yang concept of dualism relying on the eight principles of the Chinese Traditional Medicine (TCM) to understand autism. Though not validated yet, it can still be used as an alternative screening tool by parents, teachers and other interested parties, such as the TCM practitioners, to make an initial identification of someone displaying prodromal autistic spectral symptoms, ranging from one end of the continuum that shows signs of low passivity (yin) to the other end that shows signs of high activity or reactivity (yang) in responding to either eternal or internal stimuli. The screener is strictly not to be used as a diagnostic tool. However, its results may be used for a possible quick referral to the professionals for a formal assessment to be conducted so that early intervention can be provided before the condition becomes more serious over time.

Keywords: autism screener, Traditional Chinese Medicine (TCM), yin-yang concept of dualism

1. Introduction

Currently, there is no one fully agreed definition of autism. The most the widely accepted concept of autism is based on the classical triad of impairments in social interaction, communication and stereotyped behavior. Generally, autism is seen as a group of developmental brain disorders and may co-exist with other disorders, e.g., pragmatic language impairment, sensory processing difficulties and specific language impairment, forming a syndromic band of some kind [1]. The term "spectrum" or “spectra” refers to the wide range of symptoms, skills, and levels of impairment that individuals with autism exhibit. Some are mildly impaired by their autistic spectral symptoms, but others can be severely disabled with intellectual and developmental challenges and are non-verbal.

In this paper, the author took a bold step to define autism based on five autistic spectral symptoms [2]: social interaction, communication, stereotypal behavior, sensory response/reaction, and task behavior. Each spectral symptom with its five traits of different degrees of passivity-activity on a continuum will be discussed later in the deconstruction of a proposed autism screener. More importantly, the author has also borrowed the yin-yang concept of dualism

from the Chinese Traditional Medicine (TCM) to define these five autistic spectral symptoms.

The term *autism* was never mentioned in the TCM records. However, "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" (p.21) [3]. More than 2000 years ago, the spectral symptoms of autism have already been treated in 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 [3].

In the Chinese literature on autism (e.g., [4-6]), two terms have been used to describe the condition: *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" (slide 4) [7]. Xie [7] 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).

When the eight TCM principles [8] are applied in the autism diagnosis and treatment, the symptoms of guduzheng and zibizheng can be better understood using the *yin-yang* concept of dualism [9], where interior, cold and deficiency traits fall under *yin*, while exterior, heat and excess traits fall under *yang* (see Table 1). The basic traits of yin are "passive, descending, internal, has a form, cold, dark, suppresses, yielding" (p.2) [8], while the basic traits of yang are "active, rising, external, formless, warm, bright, stimulates, firm" (p.2) [8].

Individuals with more autistic symptoms closer to guduzheng are termed as autistic introverts. Those with more autistic symptoms closer to zibizheng are known as autistic extroverts. Those who fall in between the two groups are termed as atypical autistic ambiverts or non-autistic.

Table 1. Yin-Yang Concept of Dualism in Understanding Autism

	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 such as rapid breathing, irritability and constipation.
Autistic Types:	• Autistic Introvert	• Autistic Extrovert

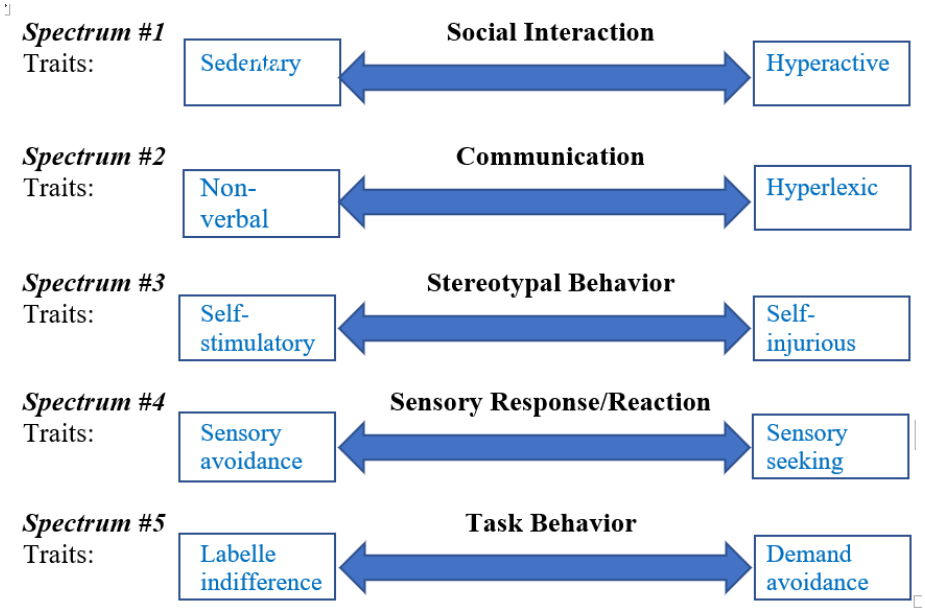

Figure 2. Five Broad Autistic Spectral Symptoms

2. The Five Broad Autistic Spectral Symptoms

Unlike the common understanding of autism based on the triad of impairments, Xie [2] has used five broad autistic spectral symptoms – social interaction, communication, stereotypal behavior, sensory response/reaction, and task behavior – that are often observed in individuals with autism (see Figure 2).

Based on the yin-yang concept of dualism, whatever symptoms that fall closer to the left of each spectrum are considered closer to guduzheng (yin) and those that fall closer to the right are closer to zibizheng (yang). On the one hand, guduzheng is more explicitly passive in terms of its sedentary disposition and aloofness (or apparently indifference to the surrounding). Individuals identified with guduzheng are described as autistic introverts. On the other hand, zibizheng is more explicitly active in terms of aggressiveness and hyperactivity, and those identified with zibizheng are described as autistic extroverts. In between the two is the yin-yang balance are those who are non-autistic or normal individuals.

Each of the five autistic spectral symptoms is described in detail below:

1. Social Interaction:

This is "a process of reciprocal stimulation or response between two people. It develops competition, interaction, influences social roles and status and people for social relationships" (para.1) [10]. Social interaction can be graded on a 5-point Likert rating scale of scores between 1 and 5:

- Sedentary behavior (Score=1): This refers to the tendency to spend much time seated or stay somewhat inactive. According to Casanova [11], "[M]any autistic individuals live a sedentary life. Reclusion prevents them from stressful social interactions and shields them from the emotional impact of unforeseen changes to their routines and general environment" (para.1).
- Socially inept (Score=2): It means being "unable to judge and improvise interactions with other people in an acceptable or 'normal' manner. By a

mix of being too keen or plain ignorant, one who is socially inept seems to live in one's own world exempt from who one is talking to" (para.1) [12].

- Socially appropriate (Score=3): This behavior is expected of a normal person to know how to behave appropriately, e.g., when interacting or socializing with others from a range of different social statuses, or addressing someone who is in authority.
- Eloping behavior (Score=4): The original definition of "elope" is "to run away and not return to the place of origin" (para.3) [13]. Elopement refers to the behavior of an individual with cognitive challenges (e.g., autism) who roams, runs away from or otherwise leaves a caregiving facility or environment without permission or anyone's knowledge [13]. The National Institute of Elopement Prevention and Resolution [14] has defined elopement as follows: "When a patient or resident who is cognitively, physically, mentally, emotionally, and/or chemically impaired, wanders away, walks away, runs away, escapes, or otherwise leaves a caregiving facility or environment unsupervised, unnoticed, and/or prior to their scheduled discharge" (para.1). In other words,
- Hyperactive behavior (Score=5): Hyperactivity is one of the common symptoms associated with autism. As young children with autism grow up over time, they can become aggressive, withdrawn or lose their language skills that they already developed earlier. Some of them also exhibit symptoms of attention deficit-hyperactivity disorder (ADHD). Many of them are prescribed with medication (e.g., Risperidone, Ritalin, and Aripiprazole) to control their aggressive and/or hyperactive behavior.

2. Communication:

This is a transmission of information from one person to another. The process seems to be simple, but in its actuality, it is rather complex. In fact, the transmission of a message can be affected by many elements (e.g., emotions, sociocultural context and the medium of communication). Good communication skills are essential in everyday living or working situations, requiring accuracy, effectiveness and non-ambiguity. Communication can be graded on the 5-point Likert rating scale with scores between 1 and 5:

- Non-verbal communication (Score=1): This refers to the lack of ability to use spoken language to communicate with others. About 25% of individuals with autism are non-verbal. Among them is a small group "with a rare condition known as verbal auditory agnosia, for whom spoken language acquisition is virtually impossible" (p.945) [14].
- Vocalizing (Score=2): This form of communication concerns uttering a sound or word, closer to making meaningless noise or creating neologistic speech, often symptomatic of a psychotic symptom (e.g., schizophrenia).
- Verbal communication (Score=3): This refers to the ability to transmit a message through spoken and/or written words.
- Echolalia (Score=4): It refers to an unsolicited repetition of vocalizations made by another person. If the same person made such vocal repetitions, it is known as palilalia. Echolalia may be an immediate reaction to a stimulus or may be delayed [15]. It can be an indicator of communication disorders in autism [16],
- Hyperlexic behavior (Score=5): This condition is characterized by a precocious ability to read without prior

training in learning to read before the age of five. Despite a significantly superior word decoding ability, such individual encounters severe impairment in the ability to comprehend [17]

3. Stereotypal Behavior:

Also known as stereotypy, this behavior refers to a persistent repetitive act for no obvious purpose. It can be a repetitive or ritualistic movement, posture, or utterance. Stereotypies may be simple movements (e.g., body rocking) or complex (e.g., self-caressing, crossing and uncrossing of legs) observed in people with intellectual and developmental disabilities, autism spectrum disorders, tardive dyskinesia and stereotypic movement disorder, but may also be encountered in neurotypical individuals as well [18].

Like the other two spectral symptoms described above, stereotypal behavior can be graded on the 5-point Likert rating scale of scores between 1 and 5:

- Self-stimulatory behavior (Score=1): Commonly known as stimming [19], it involves repetitive physical movements, noises, single words or a string of words, and/or moving objects. Such behaviors are commonly observed in individuals with intellectual and developmental disabilities, autism spectrum disorders, and also sensory processing disorders [20]. According to Foley [21] and Cowell [20], self-stimulatory behavior is a form of protective response to over-stimulation by calming oneself, e.g., by blocking less predictable environmental stimuli. Bailey [22] has postulated that self-stimulatory behavior is a way to relieve anxiety and other negative or heightened emotions
- Ritualistic behavior (Score=2): This refers to automatic behavior of psychogenic or socio-cultural origin. It is one of the key autistic traits often observed in individuals with autism. Stopping such ritualism may result in an emotional outburst or meltdown.
- Self-awareness (Score=3): This refers to introspective capacity to recognize oneself as an individual separate from others and one's environment. Self-awareness is one of the several important factors that defines personhood.
- Pica behavior (Score=4): This abnormal behavior is characterized by a huge appetite for substances that are mainly non-nutritive, e.g., feces (coprophagia), hair (trichophagia), ice (pagophagia), metal (metallophagia), paper (xylophagia), and soil (geophagia). Pica is most common in people with intellectual and developmental disabilities and autism spectrum disorders, and also observed in children aged two to three years old [23]. Pica behavior can also surface in children with traumatic brain injuries that affect their development.
- Self-injurious behavior (Score=5): According to Edelson [24], "[S]elf-injurious behavior is one of the most devastating behaviors exhibited by people with developmental disabilities. The most common forms of these behaviors include: head-banging, hand-biting, and excessive self-rubbing and scratching" (para.1).

4. Sensory Response/Reaction:

According to Chia and Lim [25], there are two types of sensory behavior, which can be assessed by administering the Sensory Profile [26], relating to sensory stimuli: sensory response and sensory reaction. The former is more thoughtful and it involves some rational thinking or reasoning, while the latter is more of taking a defensive stance because the individual concerned is at a disadvantage.

Hence, "in reaction, it is the emotion that takes the central role and this can lead to a downside, i.e., the loss of control" (p.5) [25]. This spectral symptom can be graded on the 5-point Likert rating scale of scores between 1 and 5:

- Sensory avoidance (Score=1): Someone who is an extreme sensory avoider is also described as over-sensitive. This sensory behavior may be referred to as hypersensitivity [27]. Such a person can experience sensory input more intensely than an average individual, and he/she may avoid it because to him/her, it is overwhelming to cope with. A child with autism who has problems related to sensory avoidance may appear timid. Often, he/she is noted to be a picky eater or be quite particular about the texture of clothing he/she wears.
- Sensory hyper-responsive (Score=2): This refers to an individual with autism who is somewhat less than his/her peers in being over-sensitive/hypersensitive or hyper-responsive.
- Sensory modulation (Score=3): Also referred to as self-regulatory behavior, it involves organizing sensory information received by regulating sensory input to make sense of one's physical context and one's place within that context. It happens automatically, unconsciously and effortlessly in normally developing children. Therefore, with an efficient sensory modulation, one is able to effectively regulate the degree to which one is influenced by various sensory inputs. The efficient sensory modulation allows the central nervous system to manage executive functions, such as attention and activity level, by enabling one "to attend to important stimuli, filter out irrelevant stimuli, and modify the amount of stimulation one is exposed to" (para.1) [28]. For those with developmental challenges, their sensory modulation is inefficient and it demands more effort and attention without assurance of accuracy. This results in varied self-regulatory problems.
- Sensory hypo-responsive (Score=4): This refers to an individual with autism who is somewhat more than his/her peers in being under-sensitive or hyposensitive or hypo-responsive.
- Sensory seeking (Score=5): An individual who is an extreme sensory seeker is described as under-sensitive to input. This sensory behavior may be referred to as hyposensitivity [27]. This means that the person will look for *more* sensory stimulation*. Children* with autism who are sensory seekers may appear clumsy, talk a little too loud or may appear to exhibit challenging behavior issues.

5. Task Behavior:

According to Chia and Lim [29], task behavior is defined as "a behavioral and cognitive act of attention or awareness within a given time span to perform a given task" (p.5). There are five key task behaviors: on-task, off-task, break-task, switch-task, and multi-task.

The task behavior can be graded on the 5-point Likert rating scale of scores between 1 and 5:

- Labelle indifference (Score=1): This refers to "a feeling of detachment, which may appear as relaxed indifference – or labelle indifference, as it sometimes is called in psychiatric literature" (p.410) [30].
- Sporadic reactive (Score=2): This refers to a reactive behavior or reactance that occurs occasionally, singly, or in

irregular or random instances in responding to a stimulus.

- Compliant responsive (Score=3): This refers to one's response that is inclined to agree with others or obey rules.
- Resistance (Score=4): This refers to the refusal to accept/comply, e.g., rules and regulations, or an attempt to prevent something by action/argument.
- Demand avoidance (Score=5): This is now considered to be part of the autism spectrum disorder [31]. The central difficulty for someone with demand avoidance is the way he/she is driven to avoid demands and expectations. Another reason to explain this behavior is that he/she has an anxiety-based need to be in control.

3. Scoring Scheme for Autistic Spectral Symptoms

From the abovementioned five autistic spectral symptoms, they can be scored on the 5-point Likert scale with 1 = low passivity, 3 = normativity, and 5 = high activity/reactivity, while 2 and 4 are in-between's, in better understanding of the varying degree of functional severity in autistic behavior (see Table 2 below). The lowest total score possible is 5 while the highest total score possible is 25.

Putting together all these traits of the five autistic spectral symptoms with varying degrees of severity on the yin-yang continuum helps to create a quick screening tool that can be used easily by both teachers and parents as well as other allied professionals (including TCM practitioners) working with individuals with ASD. Call it a Screener for Autistic Spectral Symptoms (SASS), the main aim of this screening tool is for the primary caregivers to make an educated decision concerning an early referral for their loved ones suspected of having autism to be formally assessed and thereafter, to seek early intervention as soon as possible. The full screener is provided as follows:

Instruction:

Circle the appropriate trait that is most frequently observed for each spectral symptom that best describes the autistic behavior of the individual concerned.

Scoring:

The score is provided at the top of each column. It is scored for the trait circled for each spectral symptom. Total up the scores for all the five autistic spectral symptoms and check the scoring scheme for the interpretation below.

Table 2. A Summary of the Five Autistic Spectral Symptoms

Spectral Symptoms	1	2	3	4	5
Social Interaction	Sedentary	Socially inept	Socially appropriate	Eloping	Hyperactive
Communication	Nonverbal	Vocalising	Verbal	Echolalic	Hyperlexic
Stereotypal Behaviour	Self-stimulatory	Ritualistic behaviour	Self-aware	Pica behaviour	Self-injurious
Sensory Response	Sensory avoidance	Sensory hyper-responsive	Sensory modulation	Sensory hypo-responsive	Sensory seeking
Task Behaviour	La belle indifference	Sporadic reactive	Compliant responsive	Resistance	Demand avoidance

Scoring Scale / Spectral Symptoms	1	2	3	4	5
• **Social Interaction**	Sedentary behavior	Socially inept behavior	Socially appropriate behavior	Eloping behavior	Hyperactive behavior
• **Communication**	Nonverbal communication	Vocalizing	Verbal communication	Echolalia	Hyperlexic behavior
• **Stereotyped Behavior**	Self-stimulatory behavior	Ritualistic behavior	Self-awareness	Pica behavior	Self-injurious behavior
• **Sensory Response**	Sensory avoiding behavior	Sensory hyper-responsivity	Sensory modulation	Sensory hypo-responsivity	Sensory seeking behavior
• **Task Behavior**	Labelle indifference	Sporadic reactive behavior	Compliant responsive behavior	Resistive behavior	Demand avoidance
Sub-Total Scores:	( ) + ( ) + ( ) + ( ) + ( )				
Total Score:					
Interpretative Comments:					

Scoring Scheme for Interpretation

Scores Interpretative Descriptor

5-14 Autistic introvert type

More of guduzheng (yin)

Basic traits: Passive, descending, internal, has a form, cold, dark, suppresses, yielding

15 Atypical ambivert type of autism; non-autistic type (yin-yang equilibrium)

Ambivert type falls in the middle of the autistic introvert/extrovert continuum. Ambivert type has a blend of traits from both autistic introverts and extroverts, as well as its own unique strengths.

16-25 Autistic extrovert type

More of zibizheng (yang)

Basic traits: Active, rising, external, formless, warm, bright, stimulates, firm

If the total score is 15, it is not always the case of yin-yang equilibrium where each spectral symptom is scored 3. Here are three examples to be interpreted carefully.

Example 1: If the score sequence is 3 + 3 + 3 + 3 +3, where the total score is 15, this means the individual is atypical ambivert of autism or simply, non-autistic.

Example 2: If the score sequence is 1 + 3 + 3 + 3 + 5, where the total score is 15, it means that the first spectral symptom is sedentary and more of yin, while the fifth spectral symptom is demand avoidance and more of yang. The second, third and fourth spectral symptoms are normal and atypical of autism. In this case, it is not a pure yin-yang balance of a non-autistic type or atypical ambivert of autism. In other words, an individual with such a score can be considered as having an autistic spectrum condition but is not being exactly autistic. Such an individual with a sedentary disposition will often try to avoid demands and expectations from others.

Example 3: If the score pattern/sequence is 1 + 2 + 2 + 5 + 5, where the total score is 15, this case is different from the earlier examples. This time, the first three spectral symptoms are sedentary, vocalizing and ritualistic and more of yin, while the last two are sensory seeking and demand avoidance and more of yang. An individual with this atypical ambivert

of autism profile is closer to yin than to yang. Such an individual prefers to stay socially inactive and avoids demands and expectations from others. There is no score of 3 for any of the spectral symptoms. All the scores fall either closer to yin or closer to yang. When that happens, this is a clear case of autism spectrum disorder.

4. Conclusion

Further studies are certainly required to determine the psychometric properties of this autism screener, i.e., to validate it, making the instrument more reliable than just an informal screening tool for identifying individuals with autism in terms of whether they are autistic introvert or extrovert or atypical ambivert of autism type. This screener will also allow special education professionals and other allied professionals (including TCM practitioners) to decide on the choice of treatment or to design an appropriate treatment plan as a follow-up action to help their clients/patients with autism.

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Funding: No funding was received for conducting this study.

Conflict of Interest: The Author has no conflicts of interest to declare that they are relevant to the content of this article.

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