

Defining and Validating the Concept of Neurodiversity using the PASS Theory

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ABSTRACT

Objective. Neurodiversity is increasingly recognized as a way of understanding natural variations in human cognitive functioning, particularly in individuals with conditions such as autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD), and specific learning disabilities (SLD), and intersects significantly with the field of school neuropsychology. School neuropsychology focuses on understanding and addressing the neurological and cognitive factors influencing learning and behavior in educational settings.

Method. This paper explores the theoretical origins of neurodiversity and emphasizes the need for empirically grounded methods to assess cognitive differences.

Results. The Planning, Attention, Simultaneous, and Successive (PASS) theory of intelligence offers a neurocognitive model for identifying individual cognitive profiles. Operationalized through the Cognitive Assessment System (CAS and CAS2), the PASS theory enables the measurement of intra-individual variability across cognitive processes. Data from normative samples reveal that approximately one-third of children show significant diversity among PASS scale scores, providing objective support for the neurodiversity construct. Additionally, analysis of scale profiles in children with ASD, ADHD, and SLD reveals distinct cognitive processing patterns consistent with theoretical expectations.

Conclusion. These findings highlight the utility of the PASS framework in understanding and supporting neurodivergent learners. By moving beyond global intelligence scores, the PASS theory facilitates a more nuanced, person-centered approach to assessment and intervention, aligning with contemporary perspectives on inclusion and individualized support.

Keywords:

Neurodiversity, PASS theory, Cognitive Assessment System, ADHD, autism, learning disabilities, intra-individual variability

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Neurodiversity: What is it?

The word neurodiversity refers to the variability, or neurodivergence, of all people, but it is often used in the context of autism spectrum disorder (ASD), as well as other neurological or developmental conditions such as attention-deficit/hyperactivity disorder (ADHD) and learning disabilities¹. Neurodivergence functions as an umbrella designation for individuals whose cognitive functioning diverges from what is considered neurotypical—that is, the statistically normative range of neurological development and behavior. According to the Cleveland Clinic², the term neurodivergent is a nonmedical descriptor applied to individuals whose brains process, develop, or function differently for various reasons. This divergence may manifest in unique cognitive strengths as well as weaknesses, distinguishing neurodivergent individuals from those whose neurological development aligns more closely with the general population. While some individuals identified as neurodivergent may have formal medical diagnoses—such as autism spectrum disorder, ADHD, or dyslexia—the term is inclusive of those without official clinical classification, thereby acknowledging the limitations of diagnostic criteria and the complexity of cognitive variation. Neurodiversity can be considered as the different ways that we all think, move, hear, see, understand, process information and communicate with each other.

Neurologically, we are born with 100 billion neurons or brain cells, and these become connected in billions of different ways throughout our development³. While everyone's brain develops similarly, no two brains function the same. The way our brains are wired is influenced by our genes and environmental experiences⁴, which can lead to different patterns of brain activity when performing any task⁵. Because of this, we are all neurodiverse to a degree.

Contemporary estimates suggest that approximately 15-20% of the global population exhibits some form of neurodivergence, often associated with conditions such as ADHD, autism, and dyslexia⁶⁻⁸. These prevalence rates are typically derived from aggregated public datasets and diagnostic

survey methodologies, rather than direct assessments of cognitive variability.

Executive function (EF) challenges, including difficulties with cognitive flexibility, planning/organization, and emotional control, are also common in neurodivergent children⁹. Difficulties with attention are also observed in many neurodivergent students. Broadly, attention refers to the processes that let us prioritize certain information while excluding other input¹⁰. Given the sensory overload we constantly face, attention helps filter relevant data and limits what reaches deeper processing. It can be “pulled” involuntarily, like when we hear our name or a loud noise, or “pushed” voluntarily, such as when searching for a friend in a crowd or reading despite background noise. Attention must be focused enough to resist distractions, yet flexible enough to shift when important information arises unexpectedly, such as when hearing an unexpected noise during a conversation or listening to a lesson. Attention difficulties that may be observed involve difficulty sustaining focus, making careless mistakes, and struggling to follow instructions or complete tasks. Individuals with inattentive ADHD may also have trouble prioritizing and staying on tasks and be easily distracted by external stimuli or their own thoughts. These aspects of cognition are often included in an examination of neurodiversity.

The Origin of Neurodiversity

The term Neurodiversity is rooted in sociology and psychology and used to describe the natural variation in brain function and related behaviors among humans¹¹. The term neurodiversity was put forth by Australian sociologist Judy Singer to provide an alternative language that describes neurodevelopmental conditions, such as autism, in a manner that does not focus only on deficits. Singer first wrote of the topic in her honors thesis in 1998¹² and later published as a briefer chapter in 1999¹³. Walker¹⁴ distinguishes between three different meanings of the term. The first and most basic, “neurodiversity” can simply refer to the reality that diverse minds and brains exist, just as “biodiversity” describes the factual reality of biological diversity. In this sense,

even groups of neurotypical individuals are neurodiverse, as no two individuals have the same mind or brain. The other usages of “neurodiversity” are harder to define. Walker¹⁴ identifies a specific theoretical perspective she refers to as the “neurodiversity paradigm,” though others prefer the term “neurodiversity framework”^{15,16}. Walker¹⁴ makes a distinction between neurodiversity approaches from the “neurodiversity movement,” an activist movement that seeks to advance the rights and welfare of neurologically atypical disabled people. Other researchers share similar views of what neurodiversity is, these differ from one another in important ways, such as their relationship to the social model of disability^{17,18}.

Despite their progressive aims, both the neurodiversity and social model approaches have faced criticisms and controversies. The social model has been accused of being overly rigid and impractical, particularly when applied to neurodevelopmental disabilities like autism. Critics argue that societal inclusion alone may not address the unique challenges faced by individuals with neurodivergent conditions, such as executive function difficulties or sensory sensitivities¹⁹. Moreover, tensions arise when considering the applicability of these models to individuals with intellectual disabilities or those deemed low intellectual functioning. Some argue that the principles of neurodiversity and the social model may not adequately address the complex support needs of these individuals, leading to concerns about neglecting necessary interventions and treatments²⁰.

Navigating these controversies, researchers and advocates have proposed middle-ground approaches that integrate elements of both the social model and neurodiversity perspectives. One such approach involves adopting an interactionist/ecological model of neurodiversity, which recognizes the interplay between individual characteristics and environmental factors in shaping disability experiences²¹. By acknowledging that disability arises from the dynamic interactions between individuals and their environments, this model offers a holistic framework for designing interventions that address both personal needs

and societal barriers. Interventions can target individual strengths and challenges, modify environmental factors, or combine both approaches to improve quality of life and promote inclusion.

Neurodiversity is not a narrow concept relating to one condition or one area of cognition yet for many years researchers have searched for specific genes to try to understand and locate the underlying mechanisms for specific conditions such as dyslexia, so that they would know how to support students. Neurodivergent learners experience a wide range of neurocognitive processing differences that shape how they interact with tasks and environments. These differences affect how they process sensory information, maintain attention, comprehend material, manage emotions, and interact with others. It becomes exceedingly important to have a description of neurodiversity that includes definitions and ways to document variability in neurocognitive processes. It is our position that greater specificity is needed to provide a description of neurodiversity that is theoretically based and empirically validated. This could provide a practical way to reliably measure cognitive variability based on a validated theory of how the brain works.

Operationalizing Neurodiversity and its Measurement

As with most physical or mental conditions, accurate diagnosis can lead to better interventions, treatment, and care²². By properly assessing neurodiverse individuals with appropriate assessment tools, we can better address their needs. An accurate diagnosis can help explain a student’s problem, inform decisions, and tailor treatment to their needs. The PASS theory of neurocognitive functioning, as operationalized in the Cognitive Assessment System²³ and the Cognitive Assessment System (CAS2, CAS2-Brief)²⁴, provides a way to explain neurodiversity and measure neurocognitive variations.

The PASS Neurocognitive Theory

PASS theory, conceptualized by Alexander Luria²⁵ and later refined by Das & Naglieri²⁶, focuses on the neurocognitive processing underlying human in-

telligence and cognitive functioning. The acronym PASS stands for Planning, Attention, Simultaneous, and Successive processing abilities, which encapsulates the four primary cognitive processes involved in how individuals perceive and respond to the world around them²⁷. PASS theory provides a framework for understanding the complexities of cognitive function and intelligence through the lens of neuropsychology. Luria hypothesized that human cognitive functions can be conceptualized within a framework of three separate but interrelated brain systems that provide four basic psychological processes²⁸. Each of these neurocognitive abilities will be described in the sections that follow.

Planning

The planning component of the PASS theory encompasses the ability to set goals, predict outcomes, and formulate strategies to achieve specific objectives, especially in situations where no method is apparent or a solution is unclear²⁹. This process requires higher-order executive functions, which are primarily associated with the prefrontal cortex. Effective planning allows an individual to organize thoughts, remain flexible in approach, and adapt strategies as necessary based on feedback and new information. Research has shown that deficits in planning can significantly affect an individual's ability to solve complex problems and make decisions, highlighting its critical role in overall cognitive function³⁰.

Subtests on the Planning scale of the Cognitive Assessment System, 2nd edition (CAS2)²⁴ vary in their content, but they all present the examinee with novel problems to solve. The examinee who implements a good strategy completes the task more efficiently and, therefore, obtains a higher score. The Planned Codes subtest is a good example of a task that can be solved using a strategy. The subtest requires the child to write specific letter codes under the corresponding letter (e.g., XO for A, OX for B, etc.). Children often use a strategy such as completing all the As and then the Bs, which results in higher scores than those who do not. All three subtests on the Planning scale are more efficiently completed using a strategy. These subtests

measure a child's capacity to organize information and develop a strategy for completing a task accurately. It is particularly focused on assessing higher-order executive functions involved in planning, organization, and sequential reasoning.

Several neuro-networks underlie planning and executive function. The Frontal-Parietal Network involves several aspects of the prefrontal cortex and the cingulo-opercular network³¹. The prefrontal cortex (PFC) involves the dorsal lateral (DLPFC) and ventral lateral (VLPFC), medial prefrontal cortex (MLPFC), and the anterior cingulate cortex (ACC). The dorsolateral PFC is crucial for working memory, planning, and cognitive control. The ventrolateral PFC is involved in attention, response inhibition, and task-set switching. Whereas the medial PFC and the anterior cingulate cortices are important for monitoring performance, error detection, and decision-making and response selection. The cingulo-opercular network involves the anterior insula and the anterior midcingulate cortex. The former plays a role in maintaining task sets and directing attention to relevant stimuli, and the latter is associated with cognitive control and performance on demanding tasks.

Attention

Attention is a crucial part of the PASS theory, acting as the cognitive function that allows individuals to focus on relevant stimuli while filtering out distractions. This process can be seen as the backbone of all other cognitive activities, as it determines what information enters our conscious awareness, provides for overall cortical arousal, and higher forms of attention, and is required for the recruitment of other neurocognitive processes³². Higher forms of attention include focused and selective cognitive activity, shifting attention based on salience, and resistance to distraction. The longer attention is needed, the more the activity requires effort. The neural substrates for attention involve multiple brain areas, including the reticular activating system, parietal lobes and anterior cingulate cortex. Research indicates that attention is not merely a passive process but an active one that involves engaging and maintaining

focus, which is influenced by both internal motivation and external environment³³.

As an example, the Expressive Attention subtest in the CAS2 requires the student to identify one aspect of a target stimulus (e.g., the color blue) and resist responding to distractions (e.g., the red word written in blue ink) as in the Stroop test³⁴. This task requires resistance to distraction, and focused, selective, sustained, and effortful activity³⁵. Focused attention allows for the identification of a specific stimulus, selective attention provides the inhibition of responses to distracting stimuli, and sustained attention provides continued effort over time.

Attention is a multiplex process that involves a complex interplay of neural networks distributed throughout the brain, encompassing both cortical and subcortical regions. Attention processing in the brain involves a complex network of interconnected brain regions, including the dorsal and ventral attention networks, which are crucial for directing attention to specific locations or features and for detecting salient stimuli, respectively³⁶. The dorsal attention network regulates goal-directed voluntary attention. Key regions include the frontal eye field, superior parietal lobule, and the intraparietal sulcus³⁷. The ventral attention network is primarily involved in stimulus-driven, bottom-up attention, meaning it helps us detect unexpected or salient stimuli. Key regions include the inferior frontal gyrus, inferior parietal lobule, middle frontal gyrus, superior temporal gyrus, and the temporo-parietal junction³⁷.

Simultaneous

Simultaneous processing refers to the ability to integrate and synthesize information from different sources to form a coherent understanding of instruction, a situation, or a task. This type of processing is essential for tasks that require the comprehension of complex or holistic relationships, such as spatial reasoning, pattern recognition, as well as linguistic stimuli that require comprehensive grammatical structures. It is important to recognize that Simultaneous processes can involve non-verbal as well as verbal content. The grammatical

dimension of Simultaneous processing provides a way to integrate words into ideas through the comprehension of word relationships, prepositions, and inflections, so the person can obtain meaning. This integration is central to reading comprehension³⁸. As an example, the Verbal Spatial Relations subtest on the CAS2 is a task that demands Simultaneous processing. It requires that the examinee understand the interrelationships of objects presented in six different scenes. The task is to identify which scene corresponds to a verbal statement (e.g., “which picture shows a ball under the table?”) provided by the examiner. The other subtests on the Simultaneous scale require understanding relationships, for example, among shapes (i.e., Matrices and Figure Memory). Luria²⁵ posited that simultaneous processing, together with other brain areas, relies on the right hemisphere of the brain, which is more adept at integrating visual and spatial information. Research in cognitive neuroscience supports the significance of integrated processing in tasks such as mathematical problem-solving and reading comprehension, where the simultaneous interpretation of multiple elements is essential³⁹.

The multiple brain regions that contribute to simultaneous processing interact dynamically, forming networks that allow the brain to process information in an integrated and flexible manner. Several key brain areas are involved in simultaneous processing, including the posterior parietal cortex, the occipital lobes, the temporal lobes, aspects of the prefrontal cortex, and the visual processing pathways. The posterior parietal cortex—particularly in the right hemisphere—is critically involved in integrating sensory information, spatial awareness, and attention⁴⁰. The occipital lobes are essential for perceiving patterns, forms, and spatial relationships²⁶. The superior temporal gyrus of the temporal lobes plays a central role in integrating auditory information, such as when individuals are thinking and following multiple lines of conversation simultaneously⁴¹. The dorsal and ventral visual pathways also contribute to simultaneous processing. The dorsal pathway supports spatial processing and action, while the ventral pathway is involved in object recognition. Finally, because higher-level cognitive functions are often required for tasks

involving simultaneous processing, regions of the prefrontal cortex are also engaged.

Successive

Successive processing involves the ability to organize information sequentially, essential for tasks that require step-by-step reasoning or linear problem-solving. Successive processing is used to manage any activity that is arranged in a sequence, for example, the formation of sounds and movements into a specific order. This ability is necessary for recalling information in order and understanding a statement based on the syntax of the language, as well as phonological analysis^{42,43}. Successive processing is important for the initial acquisition of reading, decoding, remembering the sequence of motor movements, speech articulation, listening comprehension, and many other tasks that require following a sequential order to complete a task or derive a solution. All CAS² subtests used to measure Successive processing vary in content, and all assess how well a student can manage a sequence of stimuli.

The neuropsychological underpinnings of Successive processing are varied. Successive engages a distributed but lateralized neural system that recruits both hemispheres, albeit with different emphases. Right hemisphere contributions are consistently highlighted in the temporal-parietal network, where ordering and timing functions are most evident. The left hemisphere regions are more strongly involved in linguistic, rule-based, and symbolic aspects of sequential processing. While both hemispheres contribute to cognitive functioning, the left hemisphere is more active in organizing processes sequentially⁴⁴. Broca's area is critical for speech production and language processing. It helps in organizing and planning language output, hence facilitating the sequencing of verbal information during speaking and understanding⁴¹. Wernicke's area is involved in the comprehension of language. Damage to this area can impair the understanding of the sequential relationships between words, demonstrating its essential role in processing verbal information⁴⁵. The angular gyrus, located at the junction of the parietal, occipital, and temporal lobes, integrates sensory information and

is important for tasks involving reading, writing, and number processing. Its role in linking letters (or numbers) to their respective sounds supports sequential processing, particularly in literacy⁴⁶. Successive processing also relies on working memory, especially the phonological loop, which holds and manipulates verbal information. This aspect of working memory is primarily influenced by the left hemisphere, allowing individuals to follow sequences of verbal instructions or processes⁴⁷. Lastly, the frontal lobe plays a role in integrating information from various neural networks and helps maintain focus on the task at hand during tasks requiring sequential or step-by-step reasoning. Research has shown that individuals with strengths in successive processing often excel in tasks that demand following sequential instructions or recalling sequences of events, highlighting the importance of this cognitive function in daily activities and learning⁴⁸.

PASS and Neurodiversity: A Cognitive Perspective

PASS theory provides a cognitive lens for appreciating and working with the diverse ways individuals process information, making it a valuable framework within the broader context of understanding and supporting neurodiversity. PASS theory emphasizes that individuals have unique cognitive processing strengths and weaknesses across the four areas (Planning, Attention, Simultaneous, and Successive). This differs from traditional cognitive models that focus on a single, overall measure of intelligence. This idea resonates with the core of neurodiversity, which highlights the natural variations in brain functioning and cognitive styles among people. Otero and Naglieri⁴⁹ summarized the variability of intelligence tests' scores for individuals with autism (ASD), specific learning disability (SLD) in reading decoding, and attention deficit hyperactivity disorder (ADHD). This variability provides evidence of neurodiversity. Rather than an examination of subtest scores, they reported the scores on the scales provided in each test. This approach was used because scales have higher reliability than subtests and scales typically correspond to some intellectual construct identified by the test authors. This level also provides

information that could be used to identify a specific pattern of strengths and weaknesses that is consistent with the concept of neurodivergence. The patterns of scores at the scale level on several measures of ability for students with ASD, ADHD, and SLD were examined. Obtained were the mean scores found in the technical manuals of the WISC-V⁵⁰, WJ III⁵¹, KABC-II⁵², DAS-II⁵³, RIAS-2⁵⁴, CAS²³, CAS2²⁴.

An examination of the findings presented in Figure 1. reveals both overarching trends and specific manifestations of cognitive performance among the cohorts of students diagnosed with ASD, SLD, and ADHD. In aggregate, the WISC-V scores for these student groups primarily clustered within the average range, a pattern also evident in their performance on the WJ-III. A noteworthy specific finding was the consistently lower Processing Speed score exhibited by students with ASD on both the WISC-V and WJ-III. Significant intergroup differences were most pronounced on the KABC-II, with students diagnosed with ADHD achieving scores within the average range, contrasting sharply with the markedly lower scores obtained by students with ASD. The

RIAS-2 did not show a particular profile for ADHD. Students with a specific learning disability in reading demonstrated a lower composite verbal index score. The CAS data indicated considerable fluctuations across the four PASS scales. The diminished Attention scale score observed within the PASS profile for students with ASD is congruent with the conceptual framework positing that individuals with ASD experience challenges in attentional disengagement and shifting⁵⁵. Students diagnosed with ADHD demonstrated a specific cognitive processing weakness on the planning scale consistent with the notion that individuals with ADHD often struggle with various aspects of executive function, such as developing strategies to work efficiently, breaking down large tasks, prioritizing, estimating time accurately, and keeping track of details. These patterns align with evidence of executive dysfunction in neuropsychiatric conditions, including ADHD⁵⁶. Students with a specific learning disability in reading decoding attained lower scores on the successive processing scale. Successive processing is a fundamental cognitive ability that plays a significant role in word decoding, reading fluency, and indirectly in reading comprehension^{32,38}.

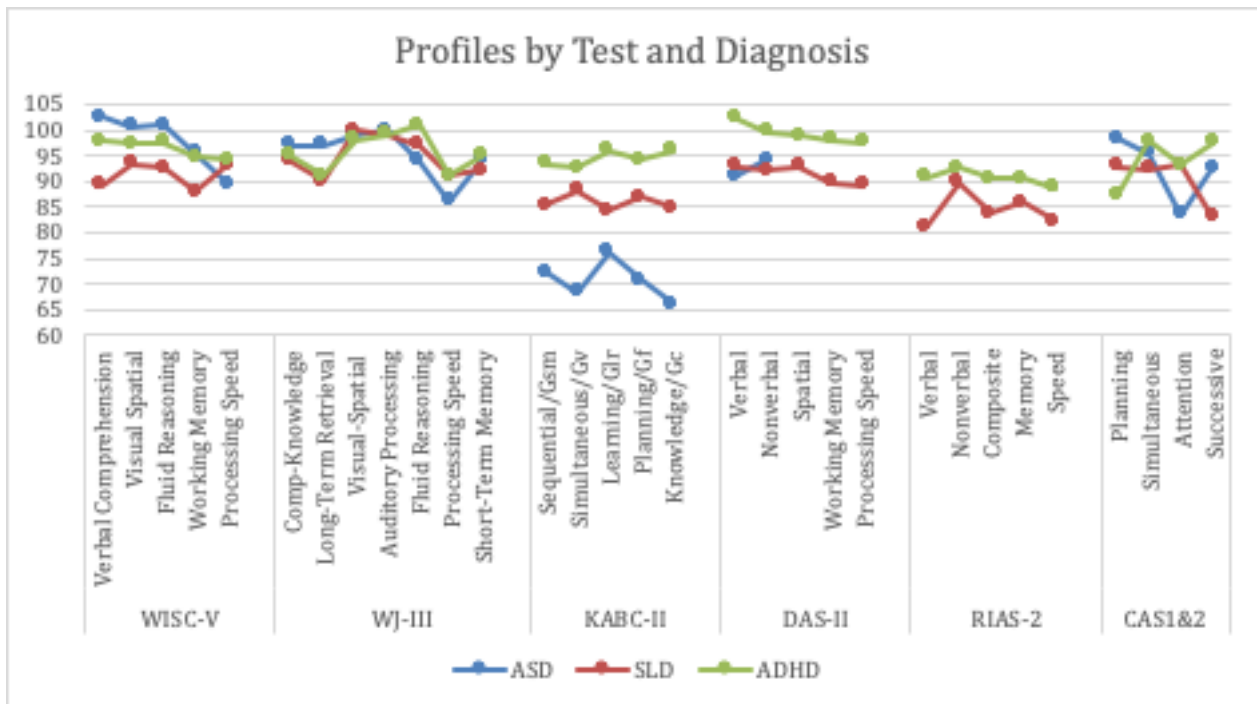


Figure 1. Scale Profiles on Various Intelligence Tests for Samples with ASD, SLD, and ADHD.

Note. DAS-II Scores for individuals with Autism were only available for the Verbal and Nonverbal Scales.

The Planning, Attention, Simultaneous, and Successive (PASS) theory of intelligence, as measured by the Cognitive Assessment System (CAS and CAS2), offers a structured approach to quantifying neurocognitive diversity through standardized assessments. Naglieri and Das²³ introduced an analytical method known as ipsative comparison, which enables practitioners to determine whether individual PASS scale scores deviate significantly from a child's average PASS profile. This method was further endorsed by Naglieri and Otero²⁷ as a robust framework for identifying intra-individual cognitive strengths and weaknesses.

Empirical data from the CAS and CAS2 normative samples that represented the general population by race, ethnicity, and socioeconomic status (Table 1) reveal that a substantial proportion of children and adolescents—approximately one-third—exhibited statistically significant discrepancies between individual PASS scales and their mean scores^{23,24}. These findings underscore the presence of meaningful neurocognitive variability within general populations, thereby supporting the neurodiversity construct. Moreover, such variability in PASS profiles may contribute to a more nuanced understanding of cognitive functioning among individuals with specific diagnoses (e.g., ADHD, dyslexia, ASD), as well as those who fall outside conventional diagnostic boundaries.

Measuring PASS Across Cultures and Languages

The applicability of the PASS theory and the Cognitive Assessment System (CAS) has extended beyond U.S. borders, showing significant promise in cross-cultural contexts, especially within Hispanic

populations. The Cognitive Assessment System–Español was developed to ensure linguistic and cultural relevance for Spanish-speaking examinees, while preserving the integrity of the PASS neurocognitive constructs. Empirical validation studies have confirmed the CAS's reliability and factorial invariance in bilingual Hispanic children across the U.S., Puerto Rico, and Latin America^{57,58}. Notably, Otero et al. demonstrated that PASS-based assessments yielded equitable and culturally fair cognitive profiles when evaluating Hispanic English Language Learners with reading difficulties⁵⁷. Similarly, research from Puerto Rico found that translated CAS2 rating scales maintained theoretical consistency and structural validity among native Spanish speakers⁵⁸.

The applicability of the PASS theory and the CAS has been increasingly explored in Portuguese-speaking populations, particularly in Brazil. Research supports the successful translation and cultural adaptation of the CAS2: Rating Scale for Brazilian students, maintaining its theoretical integrity and psychometric robustness⁵⁹. Studies also demonstrate that the CAS effectively identifies cognitive processing patterns associated with academic challenges and neurodevelopmental conditions such as ADHD⁶⁰. Furthermore, evidence suggests strong associations between PASS processes—especially Planning and Attention—and academic performance, highlighting the instrument's educational relevance in Brazilian contexts⁶¹. These findings affirm the CAS as a valid and culturally sensitive tool for cognitive assessment within Portuguese-speaking educational and clinical settings.

These findings have been echoed in broader international research, with studies in Italy⁶²,

Table 1. Percentages of Individuals in the CAS (N = 2,200) and CAS2 (N = 1,342) Normative Samples that have a PASS Score that was Significantly Different from that Individual's Average PASS Score.

	Planning	Simultaneous	Attention	Successive
CAS	21.6	26.6	21.7	32.7
CAS2	33.1	41.5	39.3	39.1
Average CAS CAS2	27.4	34.1	30.5	35.9
Overall Average	32.0			

Egypt⁶³, and China⁶⁴ demonstrating the global robustness and adaptability of the PASS theory. Collectively, this body of work reinforces the CAS as a culturally sensitive, theory-driven instrument that can reliably identify cognitive variability in diverse populations, supporting inclusive assessment practices worldwide.

SUMMARY AND CONCLUSIONS

School neuropsychology, the PASS theory of intelligence, and neurodiversity intersect through their shared emphasis on understanding cognitive diversity in educational contexts. School neuropsychology applies principles of brain-behavior relationships to assess and support students' learning and behavior. The PASS theory—focusing on Planning, Attention, Simultaneous, and Successive processes—provides a dynamic framework for evaluating cognitive functions that align with these neuropsychological goals. Neurodiversity complements this by recognizing cognitive variations as natural and valuable, rather than deficits. Together, these perspectives promote individualized assessment and intervention strategies that respect diverse learning profiles and foster inclusive educational practices.

This paper explored neurodiversity as a framework for understanding the natural variability in human neurocognitive functioning. Originating in sociology, the concept has evolved to encompass cognitive profiles commonly associated with conditions such as autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD), and dyslexia. Neurodiversity acknowledges both diagnosed and undiagnosed individuals whose cognitive functioning diverges from neurotypical norms, emphasizing strengths as well as challenges.

The PASS theory of intelligence provides a theoretically grounded and empirically validated

framework for assessing neurodiversity. This model moves beyond global intelligence metrics to assess discrete cognitive processes. Through ipsative comparisons of scale scores, it identifies meaningful intra-individual differences that reflect neurocognitive diversity. Empirical data from the Cognitive Assessment System (CAS and CAS2) show that nearly one-third of normative samples exhibit significant variation across PASS scales, supporting the prevalence and measurable nature of neurodiversity patterns identified across various cognitive assessment tools. This further reinforces the perspective. Students with ASD, ADHD, and SLD demonstrate distinct PASS profiles—e.g., ASD with reduced attention scores, ADHD with planning deficits, and SLD with weaknesses in successive processing. These findings provide neuropsychological validation for the heterogeneity within and across diagnostic groups.

Future Directions

As the conceptual and empirical foundation for neurodiversity continues to evolve, future research should aim to expand the application of the PASS theory across broader populations across many cultures, including adolescents and adults, as well as underrepresented groups. Longitudinal studies examining how PASS profiles change over time may offer valuable insights into cognitive development and the stability of neurodivergent traits. Furthermore, integration of PASS-based assessments with neuroimaging and genetic data could strengthen the biological validity of cognitive profiles associated with neurodivergent conditions. In educational and clinical practice, the development of intervention models tailored to individual PASS profiles represents a promising avenue for more personalized and effective support strategies. Continued refinement of assessment tools, such as digital adaptations of the CAS2 will also enhance accessibility and precision in diverse settings.

Disclosures

Dr. Tulio M. Otero is co-author of the Cognitive Assessment System- Español, and the forthcoming Cognitive Assessment System²nd edition: Digital.

Dr. Jack A. Naglieri is the primary author of the Cognitive Assessment System, the Cognitive Assessment System-2nd Ed, Cognitive Assessment System- Español, and the forthcoming Cognitive Assessment System-2nd edition: Digital.

Both authors receive royalties on the sale of these instruments.

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