WMS®5

Wechsler Memory Scale®

Fifth Edition

Technical and Interpretive Manual

David Wechsler,

Lisa Whipple Drozdick,

and Jennifer Puig

Pearson

Please refer to the copyright page of the *WMS-5 Administration and Scoring Manual* for how to cite the WMS-5 complete battery. When referencing this manual specifically, please cite according to APA style as follows:

Wechsler, D., Drozdick, L. W., & Puig, J. (2025). *Wechsler Memory Scale* (5th ed.): *Technical and interpretive manual.* NCS Pearson.

For inquiries or reordering:
800.627.7271
www.PearsonAssessments.com

NCS Pearson, Inc. 5601 Green Valley Drive Bloomington, MN 55437

Produced in the United States of America.

v.A A103000412084

Table of Contents

List of Tables

List of Figures

Score Names and Abbreviations – Standard Form

Name	Abbreviation
Primary Subtest Scores	
Brief Cognitive Status Exam	BCSE
Logical Memory 1	LM 1
Logical Memory 2	LM 2
Verbal Paired Associates 1	VPA 1
Verbal Paired Associates 2	VPA 2
CVLT 3 Trials 1–5 Correct	CVLT 3 T1–5 Correct
CVLT 3 Delayed Recall Correct	CVLT 3 DR Correct
Visual Reproduction 1	VR 1
Visual Reproduction 2	VR 2
Designs 1	DE 1
Designs 2	DE 2
Symbol Span	SSP
Spatial Addition	SA
Primary Index Scores	
Auditory Memory Index	AMI
Visual Memory Index	VMI
Visual Working Memory Index	VWMI
Immediate Memory Index	IMI
Delayed Memory Index	DMI
Process Scores – Auditory Memory	
Logical Memory 1 Story A First Recall	LM 1 Story A First Recall
Logical Memory 1 Story A Second Recall	LM 1 Story A Second Recall
Logical Memory 1 Story A	LM 1 Story A
Logical Memory 1 Story B	LM 1 Story B
Logical Memory 1 Story C	LM 1 Story C
Logical Memory 2 Story A	LM 2 Story A
Logical Memory 2 Story B	LM 2 Story B
Logical Memory 2 Story C	LM 2 Story C
Logical Memory 2 Recognition	LM 2 Recognition
Logical Memory 2 Recognition Story A	LM 2 Recognition Story A
Logical Memory 2 Recognition Story B	LM 2 Recognition Story B
Logical Memory 2 Recognition Story C	LM 2 Recognition Story C
Verbal Paired Associates 1 Recall A	VPA 1 Recall A
Verbal Paired Associates 1 Recall C	VPA 1 Recall C
Verbal Paired Associates 1 Easy Items	VPA 1 Easy Items
Verbal Paired Associates 1 Hard Items	VPA 1 Hard Items
Verbal Paired Associates 1 Extra-List Intrusions	VPA 1 Extra-List Intrusions
Verbal Paired Associates 1 Intra-List Intrusions	VPA 1 Intra-List Intrusions
Verbal Paired Associates 1 Total Intrusions	VPA 1 Total Intrusions
Verbal Paired Associates 2 Easy Items	VPA 2 Easy Items
Verbal Paired Associates 2 Hard Items	VPA 2 Hard Items
Verbal Paired Associates 2 Extra-List Intrusions	VPA 2 Extra-List Intrusions
Verbal Paired Associates 2 Intra-List Intrusions	VPA 2 Intra-List Intrusions
Verbal Paired Associates 2 Total Intrusions	VPA 2 Total Intrusions

Score Names and Abbreviations – Standard Form *(continued)*

Name	Abbreviation
Process Scores – Auditory Memory (*continued*)	
Verbal Paired Associates 2 Recognition	VPA 2 Recognition
Verbal Paired Associates 2 Recognition Easy Items	VPA 2 Recognition Easy Items
Verbal Paired Associates 2 Recognition Hard Items	VPA 2 Recognition Hard Items
Verbal Paired Associates 2 Recognition Hits	VPA 2 Recognition Hits
Verbal Paired Associates 2 Recognition False Positives	VPA 2 Recognition False Positives
Verbal Paired Associates 2 Recognition Discriminability	VPA 2 Recognition Discriminability
Verbal Paired Associates 2 Word Recall Correct	VPA 2 Word Recall Correct
Verbal Paired Associates 2 Word Recall Intrusions	VPA 2 Word Recall Intrusions
Verbal Paired Associates 2 Word Recall Repetitions	VPA 2 Word Recall Repetitions
Process Scores – Visual Memory	
Visual Reproduction 1 Trial 1	VR 1 Trial 1
Visual Reproduction 1 Trial 2	VR 1 Trial 2
Visual Reproduction 1 Average Completion Time	VR 1 Avg. Completion Time
Visual Reproduction 1 Additional Design Elements	VR 1 Additional Design Elements
Visual Reproduction 2 Average Completion Time	VR 2 Avg. Completion Time
Visual Reproduction 2 Additional Design Elements	VR 2 Additional Design Elements
Visual Reproduction 2 Recognition	VR 2 Recognition
Visual Reproduction 2 Copy	VR 2 Copy
Designs 1 Content	DE 1 Content
Designs 1 Spatial	DE 1 Spatial
Designs 2 Content	DE 2 Content
Designs 2 Spatial	DE 2 Spatial
Designs 2 Recognition	DE 2 Recognition
Ancillary Index Scores	
Auditory Immediate Memory Index	AII
Auditory Delayed Memory Index	ADI
Auditory Recognition Memory Index	ARI
Visual Immediate Memory Index	VII
Visual Delayed Memory Index	VDI
Visual Recognition Memory Index	VRI
Designs Content Index	DCI
Designs Spatial Index	DSI
Multitrial Learning Index	MTLI
Single Trial Learning Index	STLI

Score Names and Abbreviations – Short Form

Name	Abbreviation
Primary Subtest Scores	
Logical Memory 1	LM 1
Logical Memory 2	LM 2
Visual Reproduction 1	VR 1
Visual Reproduction 2	VR 2
Symbol Span	SSP
Index Scores	
Auditory Memory Index	AMI (LM)
Visual Memory Index	VMI (VR)
Immediate Memory Index	IMI (LMVR)
Delayed Memory Index	DMI (LMVR)
Process Scores	
Logical Memory 1 Story A First Recall	LM 1 Story A First Recall
Logical Memory 1 Story A Second Recall	LM 1 Story A Second Recall
Logical Memory 1 Story A	LM 1 Story A
Logical Memory 1 Story B	LM 1 Story B
Logical Memory 1 Story C	LM 1 Story C
Logical Memory 2 Story A	LM 2 Story A
Logical Memory 2 Story B	LM 2 Story B
Logical Memory 2 Story C	LM 2 Story C
Logical Memory 2 Recognition	LM 2 Recognition
Logical Memory 2 Recognition Story A	LM 2 Recognition Story A
Logical Memory 2 Recognition Story B	LM 2 Recognition Story B
Logical Memory 2 Recognition Story C	LM 2 Recognition Story C
Visual Reproduction 1 Trial 1	VR 1 Trial 1
Visual Reproduction 1 Trial 2	VR 1 Trial 2
Visual Reproduction 1 Average Completion Time	VR 1 Avg. Completion Time
Visual Reproduction 1 Additional Design Elements	VR 1 Additional Design Elements
Visual Reproduction 2 Average Completion Time	VR 2 Avg. Completion Time
Visual Reproduction 2 Additional Design Elements	VR 2 Additional Design Elements
Visual Reproduction 2 Recognition	VR 2 Recognition
Visual Reproduction 2 Copy	VR 2 Copy

Score Names and Abbreviations – Alternate Form

Name	Abbreviation
Primary Subtest Scores	
Logical Memory 1	LM 1 (ALT)
Logical Memory 2	LM 2 (ALT)
Visual Reproduction 1	VR 1 (ALT)
Visual Reproduction 2	VR 2 (ALT)
Index Scores	
Auditory Memory Index	AMI (ALT)
Visual Memory Index	VMI (ALT)
Immediate Memory Index	IMI (ALT)
Delayed Memory Index	DMI (ALT)
Process Scores	
Logical Memory 2 Recognition	LM 2 (ALT) Recognition
Visual Reproduction 2 Recognition	VR 2 (ALT) Recognition
Visual Reproduction 2 Copy	VR 2 (ALT) Copy

Chapter 1. Introduction

The Wechsler Memory Scale® (5th ed.; WMS®-5) is the revision of the Wechsler Memory Scale (4th ed.; WMS–IV; Wechsler, 2009). The WMS-5 is an individually administered clinical instrument for assessing memory and working memory processes in adolescents and adults. This revision includes subtest and index scores that reflect memory performance in specific domains (e.g., auditory memory, immediate memory). Significant revisions are incorporated into the new edition, including new norms, new forms, and new scores. The WMS-5 includes four forms: a Standard Form, a Short Form, an Alternate Form, and an Immediate Memory Screener.

This manual contains the information required to evaluate the research behind the development of the WMS-5, as well as the reliability, validity, and clinical utility of the instrument.

Theoretical Foundation

Historical and Current Trends in Memory Theory

Memory is a foundational construct that supports our cognitive, emotional, and behavioral lives. The ability to experience an event, either directly or vicariously, learn from it, and then apply that information to similar situations in the future is essential for successfully navigating our environment and is central to our sense of self. Merging several definitions, Lezak et al. (2012) defined memory as the ability to retain and retrieve information and recall or recognize previous experiences. Retaining information or experiences requires awareness, and remembering information can be either a subconscious (automatic) or a conscious (intentional) process. Declarative episodic memory is a conscious, intentional process and among the most amenable to measurement; therefore, it is the type of memory assessed by the WMS-5.

The Multi-Store Memory model initially proposed by Atkinson and Shiffrin (1968) provides the theoretical framework through which subtests on the WMS-R and subsequent editions were developed. In this model, memory formation is conceptualized as a process through which information is perceived and then transformed for either immediate use or long-term storage. A stimulus is registered and held in sensory storage for a very brief amount of time (2,000 milliseconds for auditory information and 200 milliseconds for visual information), and then it is forgotten or moves into short-term memory. The immediate memory stage of short-term memory refers to the temporary storage of information, from seconds to a few minutes. Information can be retained in short-term memory for longer when it is rehearsed. Information in short-term memory may be retained for a few hours to a few days, but it is not necessarily retained in the long term. Information in short-term memory is either forgotten or moves to long-term memory. Long-term memory refers to the permanent or more stable storage of information. The process by which external information is transformed into mental representations or memories is referred to as encoding (Atkinson & Shiffrin, 1968). Consolidation refers to the biological processes that solidify information from short-term memory into long-term memory stores (Squire & Butters, 1992). The process of bringing stored

information into conscious awareness, or remembering, is referred to as retrieval. Although this model is discussed as a sequence of events, each process can occur simultaneously. Memory problems can occur within any stage of this process. While the Atkinson and Shiffrin model focuses on short-term memory as a concept, recent theories discussed later in this chapter incorporate this concept into a more comprehensive working memory model (e.g., Baddeley, 2012).

In current neuropsychological theories of learning and memory, long-term memory is often categorized into either implicit or explicit memory. Implicit memory is an unconscious process and can include classical conditioning and overlearned, automatic behavioral responses (e.g., driving a car or riding a bike). In contrast, explicit memory is the ability to store and retrieve specific pieces of information or knowledge consciously (Squire & Butters, 1992).

Explicit memory can be further divided into semantic and episodic memory, although these may not reflect independent cognitive systems. Semantic memory involves memories for general facts and concepts. Episodic memory involves information that is situation and context specific. However, other theories of episodic memory postulate that information must pass through semantic memory before it is encoded into episodic memory (Szpunar et al., 2008). This implies that previous knowledge or skill influences the efficiency of the episodic memory system. In view of this conceptual framework, the WMS-5 is primarily a measure of declarative episodic memory. That is, the information presented is novel and contextually bound by the testing situation, and it requires the examinee to learn and retrieve information.

Multiple factors affect encoding, consolidation, and retrieval processes of episodic memory. The quality of initial encoding is influenced by the level of attention directed at the stimulus, which may be a function of the novelty and interest aroused by the stimulus. The novelty of presented information is influenced by previous experience and the extent to which it can be situated in context. The level of interest may be influenced by a host of internal (e.g., fatigue, hunger) and external (e.g., noise, temperature) factors. The consolidation process requires rapid neuroanatomic changes to systems supporting memory functions. Retrieval processes require the individual to actively engage in a search for relevant information using external cues and internal cues that enable the individual to access those memories. If internal cues fail, additional, more specific cues may be required or externally initiated to elicit the information (Lezak et al., 2012; Nyberg, 2008).

Concept of Working Memory

In the context of psychological testing, working memory is defined as the ability to hold information in mind and manipulate it to complete a cognitive task (Baddeley, 2021; Cowan, 2017; Miyake & Shah, 1999). This cognitive process facilitates language comprehension, the ability to learn, and reasoning skills (Baddeley, 2000b). While multiple models of working memory exist in the literature, such as the Multicomponent Model (Baddeley, 2000a; Baddeley & Hitch, 1974) and the Embedded-Process Model (Cowan, 1999; Cowan et al., 2021; Towse & Cowan, 2005), the visual working memory subtests on the WMS-5 are more strongly influenced by the Multicomponent Model. Therefore, this section will focus on that framework.

The Multicomponent Model proposes two information activation/storage systems, the Phonological Loop and the Visuospatial Sketchpad, along with an information integration system, the Episodic Buffer, which are engaged and coordinated by a higher level control system, the Central Executive. The Phonological Loop is a storage system that actively maintains information based on its acoustic and phonemic characteristics. The Visuospatial Sketchpad

stores and actively maintains information specific to visual and spatial stimuli rather than auditory stimuli. The Episodic Buffer shuttles information to and from long-term semantic and episodic memory and temporarily holds interrelated information in working memory. It allows for the maintenance of information in short-term memory as well as the integration of information processed in separate modalities but integrated in the working memory system. Finally, the working memory system is regulated by the Central Executive System, which regulates the flow of information, controls attention resources, and engages the long-term memory system (Baddeley, 2000a; Baddeley & Hitch, 1974). The regulatory aspect of working memory indicates a conceptual linkage with executive functioning and explains the associations between working memory and fluid reasoning abilities (Au et al., 2015; Kane et al., 2005; Salthouse & Pink, 2008). Both WMS-5 visual working memory subtests primarily assess the Visuospatial Sketchpad; Spatial Addition also assesses the Central Executive System.

Neuropsychological and neuroimaging studies have identified associations between neurological damage and functional impairments in the components of the Multicomponent Model. Individuals with speech dyspraxia associated with damage to the left inferior parietal lobule or left premotor areas demonstrate impairments in the Phonological Loop (Gathercole, 2008). The Visuospatial Sketchpad is affected by right hemisphere damage in the inferior prefrontal, anterior occipital, and posterior parietal cortex (Gathercole, 2008). Component processes of the Central Executive System seem to be affected by frontal lobe damage, particularly attention regulation functions (Gathercole, 2008). Additionally, working memory tasks requiring the selection of relevant information and inhibition of irrelevant information activate the dorsolateral prefrontal cortex (Ranganath & Blumenfeld, 2005).

Although it is acknowledged that visual working memory is likely mediated by verbal processes, there is some evidence that these are distinct processes. Neuroimaging studies indicate that spatial working memory is associated with activation of the right prefrontal and parietal networks, and object working memory activates the left inferotemporal region (Buchsbaum & D'Esposito, 2008). Moreover, spatial working memory tests produce activation of the right dorsal stream of vision, and object recall relates to the left ventral stream of vision (Ventre-Dominey et al., 2005).

Neuroanatomy of Memory

From early case studies of focal lesions and surgical resections (e.g., Milner et al., 1968) to current neuroimaging studies (e.g., Amin & Malik, 2013), a great deal of knowledge about the functional neuroanatomy of memory has accumulated. While a thorough review of the research investigating the neural circuitry of memory is beyond the scope of this manual (for such reviews, see Lezak et al., 2012; Nyberg, 2008; and Squire & Butters, 1992), a brief synopsis is provided.

Multiple brain structures have been identified as contributing to episodic memory functions, particularly the hippocampus for the encoding and retrieval of information (Nyberg, 2017), and the perirhinal cortex for semantic memory. Interactions of the medial temporal lobe structures (i.e., hippocampus and entorhinal cortex) with anterior and posterior structures are implicated in different aspects of episodic memory encoding and retrieval. For example, age-related changes in the prefrontal cortex are associated with memory deficits secondary to difficulties organizing and retrieving information. Posterior structures, including the parahippocampal cortex, the retrosplenial cortex, and the precuneus, are associated with remembering specific events. Additional modality-specific regions of the brain are associated with recalling the sensory (e.g., auditory, visual, olfactory) details of an event (Nyberg, 2017). Lesions of diencephalon structures, such as the thalamus, may also result in reduced memory functioning

at a different stage of the encoding–retrieval process (Lezak et al., 2012). In particular, the dorsomedial nuclei of the thalamus and mammillary bodies have projections to medial temporal structures, and damage to these regions produces significant memory impairment (Lezak et al., 2012).

It has long been observed that verbal memory may be predominantly processed in the left hemisphere, whereas visual and perceptual memory may be processed predominantly in the right hemisphere (Milner, 1968). Lateralized differences in information processing have been observed at the level of the thalamus, where aspects of the left thalamus are implicated in verbal activity and aspects of the right thalamus are implicated in processing nonverbal information (Lezak et al., 2012). However, some research has found bilateral processing of verbal and nonverbal information such that the occipital cortex contributes to visual memory, while the parietal cortex is related to spatial memory (Nyberg, 2008). Therefore, right–left dichotomy may not be the best model to account for memory deficits associated with specific stimulus modalities.

Frontal lobe dysfunction is associated with decreased learning efficiency due to failure to employ effective encoding and retrieval strategies; greater susceptibility to interference effects; problems monitoring recall for redundant or incorrect information; or a breakdown of recall of sequence, time, and source of information (Foster et al., 1994; Malloy & Richardson, 1994; Stuss & Benson, 2019). Imaging studies demonstrate activation of the dorsolateral and ventrolateral cortex during encoding and retrieval phases of episodic memory (Ranganath & Blumenfeld, 2005).

The parietal lobes are activated during episodic memory tasks but also show a high degree of activity during attention and working memory tasks, making it difficult to discern if this activity represents focused attention and working memory, which aids memory functioning, or if it is related to a specific mnemonic function (Nyberg, 2008). The cerebellum also activates during episodic memory tasks but may facilitate and coordinate activities related to the processing of memory rather than directly contributing to memory functions (Lezak et al., 2012).

The functional neuroanatomy of working memory overlaps considerably with that of episodic memory. Imaging studies consistently find activation of the frontal lobes and posterior regions such as the parietal, premotor, and cingulate regions (Dumontheil & Klingberg, 2012). Developmental research indicates that the strengthening of frontoparietal pathways is associated with improved working memory skills in adolescence (Klingberg, 2006) and parallels research in working memory training that shows greater activation in these areas after intervention (Klingberg, 2010; Kundu et al., 2013; Takeuchi et al., 2010). The brain recruits other areas in support of working memory as well. The executive control component of working memory is associated with prefrontal cortex–basal ganglia pathways for the purposes of focusing attention on relevant information (McNab & Klingberg, 2008). The cerebellum and cortico-cerebellar connections show increased activation as the working memory load of a task increases (Kirschen et al., 2005; Marvel & Desmond, 2010).

The brain systems that underlie episodic memory are also activated during semantic and working memory tasks. However, the hippocampus may play a special role in episodic memory functions. Activation of brain regions associated with episodic memory is fluid and varies by the task demands (e.g., recall versus recognition) and the nature of the stimuli (e.g., spatial versus object) to be recalled (Nyberg, 2008, 2017). The complexity of the multiple systems and brain regions associated with episodic memory functioning complicates making brain-behavior inferences from test scores.

Evolution of WMS

The Wechsler Memory Scale (WMS; Wechsler, 1945) was among the first attempts at developing a comprehensive test of memory and featured seven subtests (i.e., Personal and Current Information, Mental Control, Logical Memory, Digits Forward and Backward, Visual Reproduction, and Associate Learning) across two parallel forms. Over its 40 years of use in clinical practice, advancements in memory research and theory prompted a revision of the scale. The elucidation of memory as a process with different stages and the identification of symptoms and syndromes associated with disruption at different stages of this process made unified scores like the WMS Memory Quotient (MQ) difficult to interpret. The conceptualization of memory as a process highlighted the limitations of examining performance on immediate recall tasks alone without delayed recall tasks. Furthermore, the elucidation of stimulus-modality-specific memory deficits highlighted the need for a combination of auditory and visual memory tasks in the battery. Finally, advances in psychometric methodology during this time highlighted the need for an updated normative sample with scores derived utilizing modern norming procedures (Lezak et al., 2004; Sherman et al., 2023).

The Wechsler Memory Scale-Revised (WMS-R; Wechsler, 1987) was a response to the substantial advancements in theory, methodology, and knowledge over the timeframe in which the WMS was in use. The WMS-R made several improvements over the previous edition, including replacing the single MQ with five specific domain scores, incorporating visual memory subtests and delayed recall conditions, and improving the psychometric properties with a representative normative sample and better norming procedures. The WMS-R expanded the battery to nine subtests: Information and Orientation, Mental Control, Digit Span, Visual Memory Span, Figural Memory, Logical Memory, Verbal Paired Associates, Visual Reproduction, and Visual Paired Associates. While these changes enhanced the scale's clinical utility, some practical and technical challenges emerged. These included the absence of a parallel form, increased administration time, questions about subtest weighting in index scores, methodological concerns about the normative data development (Lezak et al., 2004), and limitations in the age range of the normative sample—leading to supplemental norms being developed by the Mayo Clinic for ages 75–94 (Ivnik et al., 1992).

The publication of the Wechsler Memory Scale (3rd ed.; WMS–III; Wechsler, 1997a) made further improvements on the WMS-R and enhanced the clinical utility of the scale. The psychometric properties of the scale were improved by increasing the sample size of each age band in the normative sample and extending the normative sample to include older adults (ages 74–89). Subtest content was updated, new measures of attention/concentration and working memory were developed, and new delayed recognition conditions were added. The WMS–III was co-normed with the Wechsler Adult Intelligence Scale® (3rd ed.; WAIS®–III; Wechsler, 1997b) and Wechsler Test of Adult Reading (Wechsler, 2001), allowing for direct ability-memory comparisons. The WMS–III had 11 subtests, and five of these were optional: Information and Orientation, Logical Memory, Faces, Verbal Paired Associates, Family Pictures, Word List, Visual Reproduction, Letter-Number Sequencing, Spatial Span, Mental Control, and Digit Span. Despite significant updates and improvements, subsequent research with the WMS–III identified some weaknesses, including concerns about test continuity across editions, the psychometric properties of the delayed recognition conditions, the interpretability of several index scores given their psychometric properties, and the sensitivity of the test in some clinical groups (Sherman et al., 2023).

The Wechsler Memory Scale (4th ed.; WMS–IV; Wechsler, 2009) improved on the third edition by simplifying the index structure and offering more primary and process scores to address clinical questions, replacing Faces and Family Pictures with the Designs subtest, simplifying the Visual Reproduction scoring criteria, replacing the Working Memory Index with a Visual Working Memory Index, and consolidating several WMS subtests into a cognitive screener. The subtests in the WMS–IV battery included the Brief Cognitive Status Exam, Visual Reproduction, Logical Memory, Designs, Verbal Paired Associates, Spatial Addition, and Symbol Span. Visual Reproduction, Logical Memory, Designs, and Verbal Paired Associates included immediate recall, delayed recall, and recognition conditions. Scores allowing for the substitution of the core Verbal Paired Associates scores with scores from the California Verbal Learning Test® (2nd ed.; CVLT®-II; Delis et al., 2000) were also provided. Like the WMS–III, the WMS–IV was co-normed with the Wechsler Adult Intelligence Scale (4th ed.; WAIS–IV; Wechsler, 2008), allowing for the direct comparison of ability-memory scores. The WMS–IV Flexible Approach (NCS Pearson, 2010) was developed to expand administration options for examiners and included normative data for four short batteries. Subtests in the WMS–IV Flexible Approach included subtests from the WMS–IV and three new subtests: Names, Faces, and Logos. The Advanced Clinical Solutions for WAIS–IV/WMS–IV (ACS; NCS Pearson, 2009) provided additional process scores for the WMS–IV, demographic adjustments to core normative scores, performance validity measures, and a tool for estimating premorbid functioning (Test of Premorbid Functioning [TOPF]). Critiques of the WMS–IV included a lack of subtest continuity with previous versions, concerns about potential verbal mediation of the visual memory subtests, and underestimation of index scores when the CVLT-II scores were substituted for the Verbal Paired Associates subtest (Thiruselvam et al., 2015).

Since its inception in 1945, the WMS has expanded and strengthened its approach to the clinical assessment of memory with each successive revision. The latest edition continues this tradition by synthesizing advancements in research and clinical practice with the strengths of the previous editions.

Structure of WMS-5 Standard, Short, and Alternate Forms

Primary and Ancillary Domains

The WMS-5 Standard Form contains seven subtests, four of which have both immediate and delayed conditions. Six of these subtests comprise the following primary domains/indexes: Auditory Memory, Visual Memory, Visual Working Memory, Immediate Memory, and Delayed Memory. Ancillary index scores are also derived from these subtests and measure narrow aspects of these domains (e.g., auditory immediate memory or multitrial learning). The composition of primary and ancillary index scores varies based on the age of the examinee. The WMS-5 Short Form includes three subtests that measure Auditory Memory, Visual Memory, Immediate Memory, and Delayed Memory. The Alternate Form includes two subtests that measure Auditory Memory, Visual Memory, Immediate Memory, and Delayed Memory. The Immediate Memory Screener measures auditory and visual immediate recall and is embedded in the Standard Form. Because it is comprised of the same subtests as the WMS-5 Standard Form, it is not called out as a separate form in tables or descriptions in the manuals. All subtests and scores relevant to the four immediate memory conditions are available in the Immediate Memory Screener. Ancillary index scores are not available for the Short and Alternate Forms.

Auditory Memory

Two subtests comprise the Auditory Memory domain: Logical Memory and Verbal Paired Associates. Both subtests are included in the Standard Form, while only Logical Memory is included in the Short Form and the Alternate Form.

Logical Memory 1 and 2

Administration of the Logical Memory 1 immediate recall condition varies based on the age of the examinee. For examinees ages 16–69 years, the examiner reads two stories of similar length. After each story, the examinee is asked to retell as much of the story as they can. For examinees ages 70–90 years, the examiner also reads two stories, and the examinee is asked to retell as much of the story as they can. However, the first story is repeated once, and the examinee is asked to retell as much of the story as they can after each presentation. After 10–30 minutes have elapsed, the examinee is administered Logical Memory 2 delayed recall, in which they retell as much of each story as they can remember. A recognition memory task, in which the examinee is asked yes/no questions about the stories presented in the immediate recall condition, is administered after the delayed free recall condition.

The Logical Memory subtest measures the retention of auditorily received narrative information immediately after presentation and after a time delay. Because the examinee is required to listen and provide verbal responses, this subtest also involves auditory perception and verbal expression skills. For examinees ages 70–90 years, a learning component is included with the repetition of one story. Individual scaled scores for each of the stories are provided as well as overall scaled scores for both the immediate and delayed recall conditions. The recognition condition of this subtest measures the examinee's ability to recognize (as opposed to freely recall) information from previously presented stories. Cumulative percentages summarizing performance on the individual story recognition item sets and overall performance on the recognition condition are provided for the Standard and Short Forms. A cumulative percentage summarizing overall performance on the recognition condition is provided for the Alternate Form.

Logical Memory on the Standard Form and Short Form includes three new stories (Story A, Story B, and Story C), nine new recognition questions for Story A, 18 new recognition questions for Story B, and 19 new recognition questions for Story C. The scoring criteria for the free recall conditions are also new to reflect the new story content.

Logical Memory on the Alternate Form contains the same content and administration procedures as the Logical Memory subtest on WMS–IV.

Verbal Paired Associates 1 and 2

Administration of the Verbal Paired Associates 1 immediate recall condition varies based on the age of the examinee. Examinees ages 16–69 years are administered a 14-item word-pair list, and examinees ages 70–90 years are administered a 10-item word-pair list. The examiner reads the age-appropriate word-pair list aloud to the examinee. The examiner then provides the first word in each word pair, and the examinee is asked to recall the second word in the pair. If the examinee responds incorrectly or does not know the answer, corrective feedback is given. A total of three trials are administered; each trial consists of the same word pairs presented in a different order across the three lists. After 10–30 minutes have elapsed, the examinee is administered Verbal Paired Associates 2 delayed recall, in which the examiner provides the first word in each word pair, and the examinee is asked to provide the second word. No corrective feedback is given for this condition. A recognition memory task, in which the examinee is asked yes/no questions about whether a stated word pair is from the original list of word pairs, is administered following the delayed recall condition. An optional Word Recall task is also provided in which the examinee is asked to freely recall all the individual words from the word-pair list.

The Verbal Paired Associates subtest measures cued recall of auditorily received word-pair list information immediately after presentation and after a time delay. Because the examinee is required to listen and provide verbal responses, this subtest also involves auditory perception and verbal expression skills. Overall performance is summarized in immediate recall and delayed recall scaled scores. For the recall conditions, scores reflecting the recall of related and unrelated word pairs, as well as incorrect responses where the recalled word is either from the target word-pair list or not, are provided. The recognition condition of this subtest measures the examinee's ability to recall the target word-pair list with additional cues to aid recollection. Additional scores on the recognition condition reflecting total hits, false positives, recognition discriminability, as well as recognition of related versus unrelated word pairs are provided. A scaled score is provided for the optional Word Recall task and additional scores for repetitions and intrusions are provided.

The target word-pair list for the Verbal Paired Associates subtest for the WMS-5 Standard Form largely remains the same as the target word-pair list for the WMS–IV except for one word pair in the cued recall trials and three word pairs in the recognition items. The number of immediate recall trials has been reduced from four to three.

Auditory Memory Index Scores

The Auditory Memory domain of the WMS-5 is composed of the Logical Memory and Verbal Paired Associates subtests for the Standard Form and the Logical Memory subtest for the Short and Alternate Forms. The substitution of Verbal Paired Associates linked scaled scores derived from California Verbal Learning Test (3rd ed.; CVLT3; Delis et al., 2017) standard scores is available for deriving the relevant auditory memory index scores. See Table 1.1 for a summary of the subtest scores that contribute to each of these index scores across forms.

Table 1.1 Subtests Contributing to Auditory Memory Index Scores

Index score	LM 1	LM 2	LM 2 Recog.	LM 1 (ALT)	LM 2 (ALT)	VPA 1/ CVLT 3 T1–5	VPA 2/ CVLT 3 DR	VPA 2 Recog.
Standard Form								
Auditory Memory	✓	✓				✓	✓	
Auditory Immediate Memory	✓					✓		
Auditory Delayed Memory		✓					✓	
Auditory Recognition Memory			✓					✓
Short Form								
Auditory Memory (LM)	✓	✓						
Alternate Form								
Auditory Memory (ALT)				✓	✓			

Visual Memory

Two subtests comprise the Visual Memory domain: Visual Reproduction and Designs. Both subtests are included in the Standard Form; however, Designs is only administered to ages 16–69. Only Visual Reproduction is included in the Short Form and the Alternate Form.

Visual Reproduction 1 and 2

The Visual Reproduction subtest is the same for all examinees. For Visual Reproduction 1 immediate recall, the examinee views a stimulus page with one or two designs on it for a specified amount of time and is then asked to draw the design(s). The examinee then views the same design or pair of designs a second time and is asked to draw the design(s) a second time. Four total items are administered: two items with one design and two items with two designs. After

10–30 minutes have elapsed, the examinee is asked to draw the designs again exactly as they saw them. A recognition memory task, in which the examinee is asked yes/no questions about whether a design is one of the designs they were shown in the immediate recall condition, is then administered. Following the recognition condition, there is an optional Copy condition where the examinee is asked to draw the design(s) while the stimulus page remains visible.

The Visual Reproduction subtest measures visual memory for line drawings of geometric figures after immediate presentation and after a time delay. The response requirements of this task include drawing, which means visual-spatial reasoning and fine motor control are also involved with this test. The recognition condition of this subtest measures the examinee's ability to recall the designs with cues to aid recollection. Overall performance is described with scaled scores for the immediate and delayed recall tasks and a cumulative percentage for the recognition and copy tasks for the Standard, Short, and Alternate Forms. Scores reflecting drawing speed, additional design elements, and single-trial and multitrial learning are also provided for the Standard and Short Forms.

Visual Reproduction on the Standard Form and Short Form includes four new items presented across two trials for the immediate recall condition. The scoring criteria are all new for the four items to reflect the new content. The recognition condition consists of 18 new items that require a yes/no response.

For the Alternate Form, the content of the Visual Reproduction subtest remains largely the same as the WMS–IV Visual Reproduction subtest; although, the administration procedures have changed. One of the items was dropped (Item 2 from the WMS–IV battery) to reduce the total number of items from five to four, and each item is administered to the examinee twice for the immediate recall condition. The scoring criteria are the same for the four designs as in the WMS–IV. The number of items on the recognition task was increased from 7 to 18.

Designs 1 and 2

The Designs subtest is administered to examinees ages 16–69 years. For the Designs 1 immediate recall condition, the examinee is shown a 4 x 4 grid with six designs on it for a specified amount of time. The examinee must select the correct designs from 12 cards and remember their locations on the grid to recreate the grid. Three different grids are presented to the examinee. After 10–30 minutes have elapsed, the examinee is asked to recreate each of the grids by remembering the designs and their locations. A recognition memory task, in which the examinee is shown a grid with two different cards in different locations and asked to identify the correct card in the correct location is administered following delayed recall.

The Designs subtest measures visual short- and long-term memory. It also involves visual perception and organization, immediate visual-spatial memory, and gross motor ability. Overall performance is reflected in scaled scores for the immediate and delayed recall conditions and a cumulative percentage for the recognition condition. Scores reflecting performance on content (i.e., remembering the design) and location of the cards are also provided.

The Designs subtest on the WMS-5 Standard Form consists of three items with six designs; two items are new and one was retained from the WMS–IV. The recognition condition consists of 18 new items, and the response requirements have been simplified so that the examinee must identify one correct card in the correct location from two choices.

Visual Memory Index Scores

The Visual Memory domain of the WMS-5 is composed of the Visual Reproduction and Designs subtests for examinees ages 16–69 on the Standard Form. The Visual Reproduction subtest comprises this index for examinees ages 70–90 on the Standard Form and for all examinees on the Short and Alternate Forms. See Table 1.2 for a summary of the subtests that contribute to these index scores across forms.

Table 1.2 Scores Contributing to Visual Memory Index Scores

Index score	VR 1	VR 2	VR 2 Recog.	VR 1 (ALT)	VR 2 (ALT)	DE 1	DE 1 Cont.	DE 1 Spatial	DE 2	DE 2 Cont.	DE 2 Spatial	DE 2 Recog.
Standard Form												
Visual Memory (Ages 16–69)	✓	✓				✓			✓			
Visual Memory (Ages 70–90)	✓	✓										
Visual Immediate (Ages 16–69)	✓					✓						
Visual Delayed (Ages 16–69)		✓							✓			
Visual Recognition (Ages 16–69)			✓									✓
Designs Content (Ages 16–69)							✓			✓		
Designs Spatial (Ages 16–69)								✓			✓	
Short Form												
Visual Memory (VR)	✓	✓										
Alternate Form												
Visual Memory (ALT)				✓	✓							

Visual Working Memory

Two subtests comprise the Visual Working Memory domain: Symbol Span and Spatial Addition. Both subtests are included in the Standard Form, while only Symbol Span is included in the Short Form. No visual working memory subtests are included in the Alternate Form.

Symbol Span

Administration of the Symbol Span subtest is the same for all examinees. For Symbol Span, the examinee views a stimulus page with one or more abstract symbols for a specified time and then selects the symbol(s) in sequential order from options on a response page. The working memory demands of Symbol Span stem from the use of proactive interference as well as sequencing requirements.

Symbol Span is designed to measure visual-sequencing working memory. It also involves mental manipulation, brief focused visual attention, visual-spatial imaging, and mental flexibility.

Symbol Span has 23 items, all retained from the WMS–IV; however, two items from the previous edition were dropped.

Spatial Addition

The Spatial Addition subtest can be administered to all examinees but features different start points for examinees ages 16–69 (Item 6) and examinees ages 70–90 (Item 1). The examinee is shown, sequentially, two grids that contain either blue circles only or both blue and red circles for a specified amount of time. The examinee then creates a new grid by combining the circles based on a set of rules. For example, if a blue circle is shown in the upper right corner of the first grid, and a blue circle is shown in the upper left corner of the second grid, the correct response is to place a blue circle in the upper right corner and a blue circle in the upper left corner on the response grid.

Spatial Addition is designed to measure visual-spatial working memory. It also involves visual perception and organization, immediate visual-spatial memory, and gross motor ability.

Spatial Addition has 23 items: nine are new and 14 were retained from WMS–IV. To extend the age range up to 90, the item difficulty coverage was expanded, and teaching items were added.

Visual Working Memory Index Score

The Visual Working Memory domain of the WMS-5 is composed of the Symbol Span and Spatial Addition subtests. The WMS-5 Visual Working Memory Index (VWMI) is derived from the Symbol Span and Spatial Addition scaled scores. The Visual Working Memory Index is available on the WMS-5 only when using the Standard Form.

Immediate and Delayed Memory

For the Standard Form and the Immediate Memory Screener, the Immediate Memory Index (IMI) is derived from all the immediate recall scaled scores available for the examinee's age. For the Short and the Alternate Forms, the IMI is derived from the Logical Memory 1 and Visual Reproduction 1 conditions. The Delayed Memory Index (DMI) is derived from all delayed recall scaled scores applicable for the examinee's age on the Standard Form. For the Short and Alternate Forms, the DMI is derived from the Logical Memory 2 and Visual Reproduction 2 conditions. The substitution of Verbal Paired Associates linked scaled scores derived from CVLT 3 standard scores is available for deriving the IMI and DMI, respectively, on the Standard Form. See Table 1.3 for a summary of the subtests that contribute to the IMI and DMI across forms.

Table 1.3 Scores Contributing to Immediate and Delayed Memory Index Scores

Index score	LM 1	LM 2	LM 1 (ALT)	LM 2 (ALT)	VPA 1 / CVLT 3 T1–5	VPA 2 / CVLT 3 DR	VR 1	VR 2	VR 1 (ALT)	VR 2 (ALT)	DE 1	DE 2
Standard Form												
Immediate Memory (Ages 16–69)	✓				✓		✓				✓	
Immediate Memory (Ages 70–90)	✓				✓		✓					
Delayed Memory (Ages 16–69)		✓				✓		✓				✓
Delayed Memory (Ages 70–90)		✓				✓		✓				
Short Form												
Immediate Memory (LMVR)	✓						✓					
Delayed Memory (LMVR)		✓						✓				
Alternate Form												
Immediate Memory (ALT)			✓						✓			
Delayed Memory (ALT)				✓						✓		

Although factor-analytic approaches attempting to differentiate immediate from delayed memory in normally aging adults usually fail to identify them as separate factors (Delis et al., 2003; Millis et al., 1999), the separation of these constructs is relevant to many clinical populations and provides examiners with important information about functional impairments.

Additional Measures

Recognition Memory

All delayed memory conditions in the WMS-5 include a recognition condition. The score distribution of the recognition conditions is highly skewed, limiting the range of scores available to derive scaled scores. Therefore, all recognition conditions have cumulative percentages available to determine the level of performance. These cumulative percentages can be converted to an equivalent sum of scaled scores to derive the Auditory Recognition Index (ARI) and the Visual Recognition Index (VRI). The VRI is only available for examinees ages 16–69 years. These scores are only available for the Standard Form.

Differences between recall and recognition memory are widely observed and have extensive support in clinical populations; however, recognition memory is difficult to separate from recall memory in psychometrically driven research. Although factor-analytic research has historically not found support for a separate recognition memory domain, recent research in clinical populations identified a factor related to delayed recognition and supports its continued use in clinical practice (Bilder et al., 2023).

Learning

The Multitrial Learning Index (MTLI) and the Single-Trial Learning Index (STLI) are derived from subtest and process scaled scores and are only available on the Standard Form. The MTLI reflects recall of information after multiple exposures to a stimulus while the STLI reflects recall after a single exposure. See Table 1.4 for a summary of the subtest and process scores that are used to derive these index scores.

Table 1.4 Scores Contributing to Multitrial and Single-Trial Learning Index Scores

Index score	LM 1 Story A, 1st Recall	LM 1 Story A, 2nd Recall	LM 1 Story B	LM 1	VR 1, Trial 1	VR 1, Trial 2	VPA 1 Recall A	VPA 1 Recall C	DE 1
Standard Form									
Multitrial Learning (Ages 16–69)						✓		✓	
Multitrial Learning (Ages 70–90)		✓				✓		✓	
Single-Trial Learning (Ages 16–69)				✓	✓		✓		✓
Single-Trial Learning (Ages 70–90)	✓		✓		✓		✓		

Cognitive Screening

The Brief Cognitive Status Exam (BCSE) is an optional subtest that provides a brief screening for significant cognitive problems and includes measures of Orientation, Time Estimation, Mental Control, Incidental Recall, Clock Drawing, Inhibition, and Verbal Production. While it is not diagnostic of a specific clinical disorder, it provides an indicator of current cognitive status (e.g., Average, Low Average). The BCSE is weighted towards measures of processing speed and mental control issues common in individuals with significant cognitive difficulties, such that low scores likely point to those processing difficulties. The content of the BCSE remains unchanged from the WMS–IV; however, scoring for Verbal Production has been modified, and the norms, including weighting of scores, have been updated for the WMS-5 to reflect normative changes.

Scores

Index Scores

The WMS-5 provides five primary index scores for all examinees. Additionally, 10 ancillary index scores are now included in the WMS-5 for examinees ages 16–69, and five ancillary index scores are available for examinees ages 70–90. Eight of the ancillary indexes were previously provided in the ACS. Additionally, nine index-level contrast scaled scores are provided in the WMS-5. Three were from the WMS–IV, five were from the ACS, and one is new. The theoretical range of the index scores is 45–155, while the theoretical contrast scaled scores range is 1–19 (the obtainable index and scaled score may vary from the theoretical range across ages).

The WMS-5 index scores are listed below. Scores only available for examinees ages 16–69 are indicated by an asterisk (*).

Primary Index Scores

Auditory Memory Index

Visual Memory Index

Visual Working Memory Index

Immediate Memory Index

Delayed Memory Index

Ancillary Index Scores

Auditory Immediate Memory Index

Auditory Delayed Memory Index

Auditory Recognition Memory Index

Visual Immediate Memory Index*

Visual Delayed Memory Index*

Visual Recognition Memory Index*

Designs Content Index*

Designs Spatial Index*

Multitrial Learning Index

Single-Trial Learning Index

Contrast Scaled Scores

Auditory Memory Index vs. Visual Memory Index Contrast Scaled Score

Visual Working Memory Index vs. Visual Memory Index Contrast Scaled Score

Immediate Memory Index vs. Delayed Memory Index Contrast Scaled Score

Auditory Immediate Memory Index vs. Auditory Delayed Memory Index Contrast Scaled Score

Auditory Recognition Memory Index vs. Auditory Delayed Memory Index Contrast Scaled Score

Single-Trial Learning Index vs. Multitrial Learning Index Contrast Scaled Score

Visual Immediate Memory Index vs. Visual Delayed Memory Index Contrast Scaled Score*

Visual Recognition Memory Index vs. Visual Delayed Memory Index Contrast Scaled Score*

Designs Spatial Index vs. Designs Content Index Contrast Scaled Score*

Subtests and Associated Scores

Multiple scores are available for each subtest. Primary subtest scores describe the overall performance on a condition of a subtest or a subtest and are used to derive the primary index scores. Process scores provide information on the strategies or processes used to complete a condition. The WMS-5 subtests and associated scores are listed in Table 1.5 by domain. Scores only available for examinees ages 16–69 are indicated by an asterisk (*), and scores only available for examinees ages 70–90 are indicated by a double asterisk (**). Scores used to derive primary index scores are indicated with the letter P. Scaled scores and contrast scaled scores generally range from 1–19, although the full range may not be obtainable across all ages.

Table 1.5 WMS-5 Standard Form Subtests and Associated Scores

Subtest	Condition	Score
Auditory Memory		
Logical Memory	Immediate Recall	Logical Memory 1 Scaled Score (P)
		Logical Memory 1 Story A First Recall Scaled Score**
		Logical Memory 1 Story A Second Recall Scaled Score**
		Logical Memory 1 Story A Scaled Score**
		Logical Memory 1 Story B Scaled Score
		Logical Memory 1 Story C Scaled Score*
	Delayed Recall	Logical Memory 2 Scaled Score (P)
		Logical Memory 2 Story A Scaled Score**
		Logical Memory 2 Story B Scaled Score
		Logical Memory 2 Story C Scaled Score*
	Recognition	Logical Memory 2 Recognition Cumulative Percentage
		Logical Memory 2 Recognition Story A Cumulative Percentage**
		Logical Memory 2 Recognition Story B Cumulative Percentage
		Logical Memory 2 Recognition Story C Cumulative Percentage*
Logical Memory Contrast Scaled Scores		LM 1 Immediate Recall vs. LM 2 Delayed Recall
		LM 2 Recognition vs. LM 2 Delayed Recall
		LM 1 Story A First Recall vs. LM 1 Story A Second Recall**
		LM 1 Story A First Recall vs. LM 2 Story A Delayed Recall**
		LM 1 Story B Immediate Recall vs. LM 2 Story B Delayed Recall
		LM 1 Story C Immediate Recall vs. LM 2 Story C Delayed Recall*

Table 1.5 WMS-5 Standard Form Subtests and Associated Scores (*continued*)

Subtest	Condition	Score
Verbal Paired Associates	Immediate Recall	Verbal Paired Associates 1 Scaled Score (P)
		Verbal Paired Associates 1 Recall A Scaled Score
		Verbal Paired Associates 1 Recall C Scaled Score
		Verbal Paired Associates 1 Easy Items Scaled Score
		Verbal Paired Associates 1 Hard Items Scaled Score
		Verbal Paired Associates 1 Extra-List Intrusions Cumulative Percentage
		Verbal Paired Associates 1 Intra-List Intrusions Cumulative Percentage
		Verbal Paired Associates 1 Total Intrusions Scaled Score
	Delayed Recall	Verbal Paired Associates 2 Scaled Score (P)
		Verbal Paired Associates 2 Easy Items Cumulative Percentage
		Verbal Paired Associates 2 Hard Items Cumulative Percentage
		Verbal Paired Associates 2 Extra-List Intrusions Cumulative Percentage
		Verbal Paired Associates 2 Intra-List Intrusions Cumulative Percentage
		Verbal Paired Associates 2 Total Intrusions Cumulative Percentage
	Recognition	Verbal Paired Associates 2 Recognition Cumulative Percentage
		Verbal Paired Associates 2 Recognition Easy Items Cumulative Percentage
		Verbal Paired Associates 2 Recognition Hard Items Cumulative Percentage
		Verbal Paired Associates 2 Recognition Hits Cumulative Percentage
		Verbal Paired Associates 2 Recognition False Positives Cumulative Percentage
		Verbal Paired Associates 2 Recognition Discriminability Cumulative Percentage
	Word Recall	Verbal Paired Associates 2 Word Recall Scaled Score
		Verbal Paired Associates 2 Word Recall Intrusions Cumulative Percentage
		Verbal Paired Associates 2 Word Recall Repetitions Cumulative Percentage
Verbal Paired Associates Contrast Scaled Scores		VPA 1 Immediate Recall vs. VPA 2 Delayed Recall
		VPA 2 Recognition vs. VPA 2 Delayed Recall
		VPA 1 Recall A vs. VPA 1 Recall C
		VPA 1 Easy Items vs. VPA 1 Hard Items

Table 1.5 WMS-5 Standard Form Subtests and Associated Scores (*continued*)

Subtest	Condition	Score
Visual Memory		
Visual Reproduction	Immediate Recall	Visual Reproduction 1 Scaled Score (P)
		Visual Reproduction 1 Trial 1 Scaled Score
		Visual Reproduction 1 Trial 2 Scaled Score
		Visual Reproduction 1 Average Completion Time Scaled Score
		Visual Reproduction 1 Additional Design Elements Cumulative Percentage
	Delayed Recall	Visual Reproduction 2 Scaled Score (P)
		Visual Reproduction 2 Average Completion Time Scaled Score
		Visual Reproduction 2 Additional Design Elements Cumulative Percentage
	Recognition	Visual Reproduction 2 Recognition Cumulative Percentage
	Copy	Visual Reproduction 2 Copy Cumulative Percentage
Visual Reproduction Contrast Scaled Scores		VR 1 Immediate Recall vs. VR 2 Delayed Recall
		VR 2 Recognition vs. VR 2 Delayed Recall
		VR 2 Copy vs. VR 1 Immediate Recall
		VR 1 Trial 1 vs. VR 1 Trial 2
Designs	Immediate Recall	Designs 1 Scaled Score (P)*
		Designs 1 Content Scaled Score*
		Designs 1 Spatial Scaled Score*
	Delayed Recall	Designs 2 Scaled Score (P)*
		Designs 2 Content Scaled Score*
		Designs 2 Spatial Scaled Score*
	Recognition	Designs 2 Recognition Cumulative Percentage*
Designs Contrast Scaled Scores		DE 1 Immediate Recall vs. DE 2 Delayed Recall*
		DE 2 Recognition vs. DE 2 Delayed Recall*
Visual Working Memory		
Symbol Span		Symbol Span Scaled Score (P)
Spatial Addition		Spatial Addition Scaled Score (P)

Goals for Revision

Update Norms and Retain Co-Norming With WAIS-5

The co-norming of the Wechsler Adult Intelligence Scale (5th ed.; WAIS-5; Wechsler, 2024) and WMS-5 was a requirement throughout the development of the WMS-5. Co-norming is required to stratify the WMS-5 by mean General Ability Index (GAI) scores and to ensure the ability-memory analyses were based on the same sample. In addition, the visual working memory subtests were collected across the two instruments during the research phases, which required overlapping data collections. The new nationally representative sample also reflected changes in the demographics of the United States since the publications of the WAIS–IV and WMS–IV in 2008 and 2009, respectively.

Shorten Administration Time

In a recent survey of neuropsychologists, the top five factors affecting the length of an evaluation included 1) goals of the evaluation; 2) age of the examinee; 3) stamina/health of the examinee; 4) sensory, motor, or cognitive limitations of the examinee; and 5) the context of the evaluation (clinical vs. forensic). Additionally, 30 percent of respondents reported that recent changes in billing practices (i.e., Current Procedural Terminology [CPT] code changes in 2019) necessitated seeing more patients for shorter amounts of time, which has resulted in shorter evaluations and increased caseloads (Sweet et al., 2021). Given the diversity of patient populations served by assessment professionals and an ever-changing billing landscape, the need for efficiency in testing persists. The WMS-5 provides shorter administration and scoring times for most individual subtests and multiple forms of varying depth of construct coverage to meet the needs of a wide variety of referral questions.

Subtest Administration

The average administration time among participants in the normative sample was reduced from the WMS–IV for several subtests by reducing the number of items or learning trials. The Verbal Paired Associates immediate recall condition includes only three learning trials for the word-pair list as opposed to the four learning trials used in WMS–IV. The Designs subtest includes three items instead of four. The Symbol Span and Spatial Addition subtests reduced administration time by streamlining the instructions, shortening the discontinue rule, and reducing the overall number of items in each subtest.

Multiple Forms

Several forms are available for the WMS-5 to help examiners develop a battery that meets the needs of their clients. The Standard Form is the most comprehensive battery and includes all subtests and conditions. The Immediate Memory Screener consists of the first three or four immediate recall subtests (depending on the age of the examinee) from the WMS-5 Standard Form and can be used when the examiner wants to screen for potential memory impairments but also wants the option to administer a comprehensive memory assessment. The Short Form consists of an auditory memory subtest, a visual memory subtest, and a visual working memory subtest and can be used as a stand-alone assessment of memory when a comprehensive assessment cannot be given or is not indicated by the referral question. The Alternate Form consists of an auditory memory subtest and a visual memory subtest, which are parallel forms of the WMS-5 Logical Memory and Visual Reproduction subtests. The Alternate Form can be given as a stand-alone measure of memory functioning and may be appropriate for reevaluations.

Develop Learning Scores

Memory and learning are intrinsically related constructs, and many disease processes (Samaroo et al., 2020) and neurodevelopmental disorders (Taanila et al., 2014) impact learning. However, the Verbal Paired Associates subtest of the WMS is the only subtest to consistently include learning trials over the course of multiple editions. The WMS-5 added learning trials to the Visual Reproduction subtest and utilized the existing learning trials in the Verbal Paired Associates subtest and Story A of Logical Memory for ages 70–90 to create a Multitrial Learning Index. Subtests that feature only a single learning trial—Stories B and C of Logical Memory 1 and the Designs 1 conditions—are incorporated into a Single-Trial Learning Index. The development of these index scores and their contrast scaled score provides clinicians with a new tool to assess the impact of repeated learning trials on immediate and delayed recall.

Update Content

The content of the WMS–IV subtests was updated to address test security, dated content, and customer feedback. The content of some of the items in the auditory memory subtests remained unchanged for several editions, which posed a test security risk and required updating. The Logical Memory subtest in the Standard and Short Forms of the WMS-5 features all new stories. The word-pair list for the Verbal Paired Associates subtests includes one item change to remove a word pair based on customer feedback received by Pearson. The content of the Visual Reproduction subtest for the Standard and Short Forms was updated and features new designs for each of the four items. Finally, two new items were developed for the Designs subtest. Specifically, Items A and C were developed using designs from WMS–IV in new configurations; Item B was retained from the WMS–IV.

Increase Construct Coverage

Additional scores that were provided on the ACS are now included on the WMS-5. These include additional subtest-level process scores, index-level scores, additional subtest- and index-level contrast scores, and ability-memory discrepancy analyses.

Modifications From the WMS–IV to the WMS-5

All subtests from the WMS–IV were retained during the development of the WMS-5, and no new subtests were added to the battery. The content and administration procedures for all subtests, except for the BCSE, were modified. The composition of the primary subtest and index scores for WMS-5 remains the same as the composition of subtest and index scores for the WMS–IV. Additional WMS–IV subtest, index, and contrast scores, previously included in the ACS, are included in the WMS-5. Age-specific test batteries were dropped from the WMS-5. As a result, the WMS-5 does not include an overlapping age band for examinees ages 65–69 for the different item sets. Instead, all examinees ages 65–69 years receive the full battery of WMS-5 subtests if the Standard Form is used.

Subtests

Table 1.6 summarizes the changes made from the WMS–IV to the Standard Form of the WMS-5 at the subtest level. For each subtest, a brief description is provided comparing the two versions. Table 1.7 summarizes the changes from WMS–IV to the Alternate Form of the WMS-5 at the subtest level.

Table 1.6 Subtest Modifications From the WMS–IV to the Standard Form of the WMS-5

	Summary of changes
Auditory Memory Subtests	
Logical Memory	New stories for both age groups.
Verbal Paired Associates	Reduced the number of trials from four to three. Changed the content of one word pair. CVLT 3 substitution in WMS-5 Auditory, Immediate, and Delayed Index Scores.
Visual Memory Subtests	
Visual Reproduction	New designs for all items. Reduced the number of items from five to four. Each item is administered twice for learning-oriented scoring.
Designs	New items were developed, each with six designs. The number of items was reduced from four to three.
Working Memory Subtests	
Spatial Addition	Items were added to allow for use in older populations. The overall number of items was reduced from 24 to 23.
Symbol Span	Items were reduced from 26 to 23 to reduce testing time.
Cognitive Screening	
Brief Cognitive Status Exam	Scoring for Verbal Production was updated to control for errors. Weighted raw scores were updated to reflect new normative data.

Table 1.7 Subtest Modifications From the WMS–IV to the Alternate Form of the WMS-5

WMS–IV	WMS-5 Alternate	Summary of changes
Auditory Memory Subtest		
Logical Memory	Logical Memory (ALT)	No changes.
Visual Memory Subtest		
Visual Reproduction	Visual Reproduction (ALT)	Designs were retained for the items. Reduced the number of items from five to four (Item 2 from the WMS–IV was dropped). Each item is administered twice to parallel the Standard Form administration procedures.