# Comprehensive Evaluations of Individuals With Visual Impairments

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## Introduction

More than seven million people in the United States and over 250 million globally have a visual impairment, including low vision and blindness (Bourne et al., 2017; Flaxman et al., 2021). Functional, uncorrectable visual impairments can be due to problems anywhere along the visual pathway, from the eye to the areas of the brain that process vision.

Individuals with visual impairments often have additional disabilities (Erin, 2007; Hatton et al., 2013; Schles, 2021). Comprehensive and standardized evaluations of an individual’s functioning serve to clarify diagnoses, support access to government services, direct treatment planning, and inform educational services. Such evaluations include psycho-educational, speech-language, and occupational therapy assessments. Without sufficient information, there is a risk that the examiner could misattribute an individual’s symptoms or behaviors to visual impairment rather than a true co-occurring condition. Diagnostic overshadowing can cause inequities in care or services and delay needed interventions. There is also a risk of over-pathologizing if assessment results are unfairly impacted by an individual’s visual impairment (Loftin, 2022; Slykerman, 2022; The Joint Commission Patient Safety Advisory Group, 2022). Examiners can prevent diagnostic under- or overshadowing by following best practices for this population. This document provides guidelines for comprehensive evaluations of individuals with visual impairments. Assessing individuals with cerebral or cortical visual impairments related to brain injury requires additional considerations beyond the scope of this document.

To appropriately administer and interpret standardized tests, examiners must have graduate-level education and supervised training in responsible test use and interpretation of standardized assessments (e.g., psychometrics, theoretical foundations of tests, and ethical administration and interpretation of clinical assessments) and maintain competency with continuing professional development, supervision, and/or consultation (American Educational Research Association [AERA] et al., 2014; American Occupational Therapy Association [AOTA], 2020; American Psychological Association, 2017; American Psychological Association Task Force on Psychological Assessment and Evaluation Guideline, 2020; American Speech-Language-Hearing Association [ASHA], 2023; Board of Directors, 2007; National Association of School Psychologists [NASP], 2020). Examiners with expertise in evaluations should also have specialized training and knowledge to work with individuals with visual impairments (Bracher & Matta, 2017; Bruce et al., 2018; Decker et al., 2018; Engle, 2019).

An essential resource for consultation and support is a visual impairment specialist. For children in school, the visual impairment specialist is typically called a teacher of students with visual impairments (TSVI). Another such professional is a low vision specialist. Even for experienced examiners, it is important to consult a visual impairment specialist throughout the evaluation (Loftin, 2022; Lund et al., 2014; Slykerman, 2022). Collaboration is key. Although visual impairment specialists are not typically trained in standardized testing methods or interpretation, their input is essential to understanding the impact of visual impairments on the individual's development, test administration, and test interpretation.

In this document, the style of person-first language was adopted for referring to the general group, which is the recommended style for writing about children per National Institutes of Health (NIH, 2023) and the recommended default style per American Printing House for the Blind (APH, 2019), ASHA (n.d.), World Blind Union (WBU) and CBM Global Disability Inclusion (WBU et al., 2020), and the American Foundation for the Blind (AFB, n.d.).

## Guidelines

### Topic 1: Examiner Collaboration

#### Guideline 1.1: Collaborate with the individual’s visual impairment specialist.

Most examiners have not had the opportunity to accumulate the experience and competencies necessary to assess individuals with visual impairments. Visual impairment specialists, specifically teachers of students with visual impairments, should collaborate with examiners throughout the evaluation process, from planning to report writing (Loftin, 2022; Minks et al., 2020; Russo, 2003) and be directly involved with co-facilitating the assessment when tests involve braille (Jaffe, 2017; Loftin, 2022). Visual impairment specialists have expertise in functional vision, learning media, assistive technology (also referred to as access technology per Siu and Presley, 2020), and Expanded Core Curriculum; knowledge of the impact of vision loss on learning and functioning; and fluency in Unified English Braille and Nemeth code.

#### Guideline 1.2: While building competence, consult with a colleague in the same field (e.g., occupational therapy, speech-language pathology, or psychology) with expertise in visual impairments.

Professionals are ethically bound to seek consultation and/or professional development to work in areas outside of their current competency (AERA et al., 2014; AOTA, 2020; American Psychological Association, 2017; ASHA, 2023; Board of Directors, 2007). In addition to collaborating with a visual impairment specialist, examiners new to assessing individuals with visual impairments should consult with a professional in their field with expertise in visual impairment. Consultation is essential to apply the information provided by the visual impairment specialist to the specific referral question. An experienced professional can help the new examiner choose appropriate assessment tools, understand the impact of adaptations or modifications on test interpretation, and discuss diagnostic conclusions. To find colleagues with experience and expertise, examiners can search for local organizations supporting individuals with visual impairments; Appendix 3 includes resources for connecting with colleagues.

#### Guideline 1.3: Evaluate with a multi-disciplinary team as visual impairments can impact functioning across domains of development.

Given that visual impairments have the potential to impact various aspects of development, a multidisciplinary team is often needed to evaluate an individual’s various areas of functioning thoroughly (Decker et al., 2018; Loftin, 2022). Best practices indicate that a teacher of students with visual impairments, psychologist, and speech-language pathologist be involved in the evaluation. The multidisciplinary team may differ depending on the referral question and whether the evaluation occurs in a medical or educational setting. Based on the individual’s needs, other specialists who may be involved include low vision specialists, orientation and mobility specialists, adaptive physical education specialists, assistive technology specialists, occupational therapists, physical therapists, special education teachers, behaviorists, inclusion specialists, recreation therapists, social workers, audiologists, ophthalmologists, and optometrists.

### Topic 2: Ecological Validity and the RIOT (record review, interview, observation, and testing) Model

#### Guideline 2.1: Use multiple methods of gathering information from various sources and informants and integrate the data for ecological validity.

In the context of evaluations, ecological validity involves the degree to which test performance and resulting inferences relate to or estimate behaviors and functioning in the real world (Chaytor & Schmitter-Edgecombe, 2003; Dawson & Marcotte, 2017; Spooner & Pachana, 2006). For evaluations to provide accurate and meaningful findings and recommendations, examiners must review data from multiple sources and techniques (AERA et al., 2014; American Psychological Association Task Force on Psychological Assessment and Evaluation Guidelines, 2020; NASP, 2020). Inconsistencies in data should be analyzed and either noted as limitations of findings or reconciled with alternative explanations of results.

While true for all evaluations, the use of multiple assessment methods and sources of information is paramount for evaluations of individuals with visual impairments given the limitations and inaccessible parts of standardized tests and the impacts of visual impairments on development and test performance (Decker et al., 2018; Lund et al., 2014; Minks et al., 2020; Nicholas, 2020; Slykerman, 2022). Identification of strengths, in addition to challenges, is essential to a comprehensive and meaningful evaluation.

One model for integration and cross-validation of data in assessment is RIOT. RIOT stands for Review records and work samples; Interview individuals knowledgeable about the examinee; Observe in relevant settings; and Test with assessments, scales, or inventories (Leung, 1993). This assessment approach brings social justice practices to evaluations by shifting the focus beyond the individual and standardized assessments to an integrated consideration of all areas of need, functioning, and situational challenges.

Using the RIOT model, examiners look beyond the test scores and consider the qualitative interpretation of test results with consideration of data from other sources as the “use of norm-referenced testing alone is insufficient to capture their abilities” (Bruce et al., 2018, p. 86). While standardized assessment has been viewed as the gold standard in evaluations, arguments have been made to de-emphasize the importance of standardized tests and focus on components typically seen as collateral information (Lund et al., 2014; Morash & McKerracher, 2017a). Appendix 1 presents examples of using the RIOT model to contextualize results.

#### Guideline 2.2: (R) Records Review: Review records specific to visual impairment.

Educational records provide information about the examinee’s history of vision supports and interventions. Key information includes the timing and intensity of braille instruction or low vision adaptations, the use of different learning media over time, educational goals related to vision, classroom and testing accommodations, and assistive technology. Functional Vision Assessments and Learning Media Assessments should be reviewed before a standardized evaluation. A teacher of students with visual impairments conducts these assessments to determine the impact of visual impairment on learning and daily functioning. Functional Vision Assessments examine how individuals use vision in daily life in familiar and unfamiliar settings at different times of the day and determine which assistive technology, adaptations, interventions, and areas of instruction are needed. Learning Media Assessments examine how individuals gather information through sensory channels and determine the learning media most appropriate to provide access to learning, such as braille or large print. A comprehensive vision assessment also includes an evaluation of the Expanded Core Curriculum (ECC), which includes compensatory skills needed to access information, social interaction, orientation and mobility, independent living, recreation and leisure, career education, assistive technology, sensory efficiency, and self-determination (Allman & Lewis, 2014). Other relevant assessments to review include evaluations from an orientation and mobility specialist, assistive technology specialist, and adaptive physical education specialist.

Reports from ophthalmologists, optometrists, and low vision clinic specialists are essential to understand vision-related diagnoses, visual acuity, and visual field loss. Medical records, including reports from pediatricians and neurologists, provide information about co-occurring or underlying medical or neurological conditions.

#### Guideline 2.3: (I) Interview: Tailor interviews to include information relevant to examinees’ visual impairment.

In addition to the typical information gathered from interviewing the examinee and other informants (i.e., parents, caregivers, teachers, service providers, or spouses), it is crucial to gather information specific to vision, such as the examinee’s history and expected course of visual impairment.

Interviews can further explore information from records review. It is important to review previous and current vision-related services and interventions, including frequency, duration, and focus of service delivery. Interviews can clarify the amount of opportunities for experiential learning, the level of independence in engaging in daily activities, and the use of assistive technology or adaptive devices and materials. For example, a teenager born blind will have had different early experiences than a teenager who became blind later in life.

Interviews can also provide insights into self-determination, autonomy, self-advocacy, and adjustment to vision loss. Vision loss may have impacts on psychosocial adjustment. Psychologists should interview and screen for mental health needs given the incidence of anxiety, depression, and general psychosocial challenges related to adjustment to vision loss among individuals with visual impairment (Augestad, 2017; Lundeen et al., 2022; Robertson et al., 2021; Sims et al., 2021). Understanding the examinee’s level of connection to the blind and low vision community will help inform recommendations, including mentorship, counseling, leisure or extracurricular activities, or activities with organizations supporting individuals with visual impairments.

#### Guideline 2.4: (O) Observation: Carefully observe the impact of vision on testing, and observe functioning in natural settings.

Observations during the assessment or in natural settings like the classroom can help the examiner understand how vision impacts test results. Examining the type and pattern of errors on tests can help to inform if difficulty with performance is conceptual or related to vision. If examinees take a long time to look at materials or need to work at a very close distance, this can indicate that vision may be impeding performance. Observations regarding visual fatigue, limitations in visual scanning, and level of self-advocacy are also integral for test interpretation and recommendations.

Observing the examinee’s ability and independence is important when adaptive devices or technology are used. For example, it can be helpful to see if an examinee is independent in using technology or devices or is dependent on prompts or assistance from the examiner. Reluctance to use recommended devices can be a barrier to growth and learning. It is important to note if accommodations and assistive technology are used consistently across environments.

For school-age youth, observations can reveal the amount of adult facilitation needed to engage in academic and social settings. Over-reliance on paraeducator support is not uncommon. Areas where growth may be impeded due to excessive support include organization of materials, planning for complex tasks, initiation in individual and group activities, socialization with peers, daily living skills, self-advocacy, and problem-solving in new environments. For instance, the student may be using guided navigation when they could be working on independent mobility using a white cane. Youth with visual impairment need to be afforded the dignity of risk, which involves individuals making choices in developmentally appropriate activities that include potential risk to foster learning, self-determination, and quality of life (Heller & Skymba, 2022).

### Topic 3: Impact of Visual Impairment on Development

#### Guideline 3.1: Review information on an individual’s visual condition and possible implications on development.

Examiners must have knowledge of the individual’s visual condition, which may be ocular, neurological, or both. The examiner must also gather information specific to the individual’s history of visual impairment, including the etiology, degree of vision loss, age of onset, and course (Hill-Briggs et al., 2007). The degree of vision loss is a significant factor in the selection, administration, and interpretation of test results. However, visual field restrictions, oculomotor dysfunction, fluctuations in vision, and other individual considerations are important supplements to the single variable of acuity. The visual impairment specialist can support the examiner with this task.

Examiners must recognize that severe congenital vision loss is associated with differences in development. The patterns most frequently noted are delays in motor development (Bakke et al., 2019), speech-language development (Andersen et al., 1984; Miner, 1963; Mosca et al., 2015), social skills (Botsford, 2013; Caron et al., 2023; Tadić et al., 2010), and emotional or behavioral difficulties (Robertson et al., 2021; Sims et al., 2021). Specific daily living skills such as dressing, self-care, and navigation in the community often require extra instruction and may develop later (Bathelt et al., 2019; Lewis & Iselin, 2002). While delays in development may be common, functioning can improve through early intervention and explicit instruction. Ongoing support and services are often needed to help the individual continue to make gains, solidify compensatory skills, and advocate for equitable access to information and experiences at school, the workplace, and in the community.

#### Guideline 3.2: Consider that children with severe visual impairment have less access to incidental learning and concept development, which can impact their performance on standardized tests, including non-visual tests.

Incidental learning is the process of unintentional, spontaneous learning that can occur while doing or observing an activity (Kelly, 2012). A tremendous amount of learning occurs incidentally from observing things around oneself. Most children pick up information without direct experience through pictures, movies, and observation. Children who are blind or severely visually impaired do not receive the same continuous information about the environment as their peers and need explicit instruction to learn many concepts about the world. Landau (1983) found that “[w]here relevant experience is lacking, concepts cannot develop; and where concepts are lacking, word meanings cannot be learned” (p. 63). Individuals who lose vision later have a visual reference for concepts while congenitally blind children develop language from direct, hands-on experiences and verbal explanations.

Some research indicates that children with visual impairments score below sighted peers on measures of verbal intelligence (Rindermann et al., 2020; Tillman & Bashaw, 1968). This performance profile could be due to the high percentage of co-occurring conditions in the visually impaired population. However, performance on tests that measure acquired knowledge, especially when they require knowledge of complex social norms, may also be lower in severely visually impaired children due to differences in experience (Bracher & Matta, 2017; Sattler & Evans, 2014). Auditory tests that rely on acquired knowledge may measure the individual’s exposure rather than capability, especially where test developers presume unimpaired visual access to the environment. For example, the Wechsler Intelligence Scale for Children (WISC) Comprehension subtest may be particularly influenced by the level of visual impairment (Groenveld & Jan, 1992; Wyver et al., 1999).

#### Guideline 3.3: Gauge the extent to which an individual has had a solid base of experiential learning prior to determining the presence of disabilities.

Examiners must review developmental history to ascertain the presence and frequency of early intervention as well as educational and life experiences. Early intervention provides opportunities for experiential learning critical for developing basic concepts. When adequate instruction by qualified specialists with consistent use of accommodations and appropriate learning media (e.g., braille or large print) has been provided, delays in functioning and performance may indicate the presence of disorders beyond the visual impairment.

### Topic 4: Considerations in Test Selection and Administration

#### Guideline 4.1: When using standardized tests, recognize the challenges and utility of the normative sample.

The most widely used standardized tests have not been developed with a representative sample of individuals with visual impairments and assume intact sensory functioning (Elliott, 2007; Kaufman & Kaufman, 2018; Korkman et al., 2007; Reynolds & Kamphaus, 2015; Wechsler, 2008; Wechsler, 2014). Test manuals will sometimes provide information on evaluating individuals with visual impairments and occasionally provide data from a clinical sample of individuals with visual impairments. To date, separate norms for people with visual impairments on commercial tests covering all ages are unavailable. The diversity of the population with visual impairments in terms of etiology, visual functioning, age of onset, and presence of co-occurring disabilities makes it exceedingly difficult and unlikely that development of such norms would occur (Bruce et al., 2018; Bylsma & Doninger, 2004; Decker et al., 2018; Dial & Dial, 2010; Hill-Briggs et al., 2007; Jaffe, 2017; Joyce et al., 2022; Minks et al., 2020; Slykerman, 2022). Even standardized tests adapted to large print, large picture, braille, or tactile graphics use the original sighted standardization samples for scoring (Jaffe, 2017; Schrank et al., 2014; Wilkinson & Robertson, 2017).

As individuals with visual impairments are typically integrated with and compared to the general population in school, work, and day-to-day life, the careful comparison of results from adapted standardized tests to the general standardization samples has utility in identifying strengths and challenges for educational and vocational planning and intervention (Dial & Dial, 2010; Gallagher & Burnham, 2017; Jaffe, 2017; Joyce et al., 2022; Satter & Evans, 2014). Examiners must use clinical judgment to determine whether standardized test results adequately represent an individual’s functioning considering potential effects on performance given the level of visual functioning, age of onset, and etiology (Hill-Briggs et al., 2007). When interpreting data quantitatively, 95% confidence intervals may be helpful to include; however, more importantly, examiners must look beyond the numbers and focus on the implications for functioning at school, work, community, or home.

#### Guideline 4.2: Assess domains such as auditory short-term memory, working memory, and listening comprehension.

Research consistently shows that as a group, individuals who are visually impaired score higher than the normative sample in auditory working memory and verbal memory, with mixed evidence of the impact of severity of visual impairment (Arcos et al., 2022; Dekker, 1993; Hull & Mason, 1995; Rindermann et al., 2020; Smits & Mommers, 1976; reviewed in Greenaway et al., 2017). Problems with these essential skills needed for auditory learning are important to identify as they may be particularly impactful to the individual with visual impairment (Gallagher & Burnham, 2017). However, listening comprehension tests typically have many items that assume knowledge generally acquired incidentally from experience, conversation, and visual mediums such as television. Qualitative analysis of the error items might reveal a lack of experience rather than low verbal ability. For example, someone who has never heard of flipping a coin might have difficulty answering a mental math question about the probability of a coin flip.

#### Guideline 4.3: Include a wider than normal sample of verbally-based measures when visually-based measures may not be valid.

For example, additional verbal intelligence sampling could be accomplished by adding supplemental verbal reasoning subtests or administering an additional verbal measure. Examiners must consider data from various sources together, especially where standardized test results do not align with other pieces of information.

#### Guideline 4.4: Allow extra time for the assessment.

Assessment of individuals with visual impairments takes longer than a typical assessment, given the need for careful preparation, administration, and analysis of test results and collection of corroborating evidence through interviews, observations, and records review. Additional factors that may increase the time needed to complete the evaluation include the need for breaks, short test sessions, or alternation of visual versus auditory tests to reduce visual fatigue.

### Topic 5: Considerations for Braille and Tactile Graphics

#### Guideline 5.1: Recognize that braille is a complex system and not a simple tactile translation of print.

While print uses one alphabetic and numeric code, braille has several codes. Australia, Canada, Ireland, New Zealand, South Africa, United Kingdom, United States, and other countries use Unified English Braille (UEB) for literacy, math, and science (International Council on English Braille, 2023). The United States has adopted two codes for technical material (i.e., math and science), UEB and Nemeth (Braille Authority of North America, 2020).

UEB has uncontracted and contracted versions. Spelling in uncontracted braille is similar to spelling in print, with every letter represented by an individual braille cell. Contracted braille spelling (orthography) is significantly different from print orthography (Englebretson, Holbrook, & Fischer-Baum, 2023). Spelling in contracted braille utilizes specific braille dot configurations to represent common words and groups of letters, similar to shorthand.

Braille involves letter-by-letter processing, but braille readers rely on morphemes (Fischer-Baum & Englebretson, 2016; Englebretson, Holbrook, Treiman, & Fischer-Baum, 2023). Braille contractions can bridge morphological units (e.g., the contraction for “er” bridges the morphemes “re” and “run” in the word rERun). Such contractions are associated with an increase in braille reading and writing errors in youth (Englebretson, Holbrook, Treiman, & Fischer-Baum, 2023) as well as proficient adult readers (Fischer-Baum & Englebretson, 2016).

#### Guideline 5.2: Evaluate braille readers along with an examiner with expertise in braille.

Proficiency in braille is needed to facilitate the evaluation of braille readers (Bradley-Johnson, 1994; Sattler & Evans, 2014). Visual impairment professionals must advise which braille code to utilize during evaluations and support the interpretation of performance. For example, certain errors are common for learners who are at the beginning stages of learning braille, given the number of similar configurations and symmetrical form of braille cells (Kamei-Hannan & Ricci, 2015), such as reversals while reading f/d, i/e, and j/h which are analogous to print reading reversals of d/b and p/q. Support from an experienced braille reader is needed to analyze errors and their implications (i.e., potential orthographic error or braille-specific error).

Standardized tests adapted into braille require a team of examiners to administer the test if the examiner is not competent in braille. The primary examiner should be proficient in the standardized administration and interpretation of the test while the auxiliary examiner should have expertise in braille and the impact of visual impairments (Jaffe, 2017). Best practices indicate at least two practice administrations by the team before administering tests for decision-making purposes. Standardized tests must only be adapted into braille as part of a rigorous process involving visual impairment experts and the original publisher.

#### Guideline 5.3: Determine the examinee’s proficiency in interpreting tactile graphics before attempting standardized tests with tactile graphics.

Tactile graphics are raised lines, dots, or patterns on plastic or paper that provide access to information from images, such as charts, drawings, diagrams, pictures, graphs, and maps. Tactile graphics may be involved in assessing academic readiness, mathematics, science, and geography concepts. Individuals must receive training to orient and interpret meaning from tactile graphics (Allman, 2009). An individual’s braille proficiency may not match their proficiency in tactile graphics. Examiners cannot assume that an individual with visual impairment innately understands tactile graphics and must consult with a visual impairment specialist before administering standardized assessments that include tactile graphics.

### Topic 6: Use of Visual Stimuli in Assessment

#### Guideline 6.1: Administer tests with visual stimuli when appropriate based on the individual’s level of vision.

Individuals with visual impairments show at least as much diversity in manners of learning and performance as do others. Therefore, the examiner must explore all aspects of cognitive functioning. Although seemingly contradictory, for some individuals with visual impairments, the visual channel represents the best mode of learning and performing.

Standardized tests range from entirely accessible to entirely inaccessible, depending on the test and the degree and type of vision loss of the examinee. In many cases, it is appropriate to attempt to administer visually-based tasks if the results of the Functional Vision Assessment and Learning Media Assessment indicate that the individual has enough sight to use vision for at least some learning.

#### Guideline 6.2: Interpret visually-based test results as a minimum estimate of functioning.

Even with appropriate accommodations (e.g., enlargement), all test items may not be equally accessible to an individual with visual impairment. It is complicated, sometimes impossible, to determine the actual impact of the visual impairment. To better understand how vision impacts an individual’s score, it can be useful to do “visual checks,” using open-ended prompts such as “describe what you see on this page.” Observation of how an individual approaches a visual test, including types of errors made, can provide information about the functional impacts of the visual impairment. The examiner should be alert to errors due to impaired color vision, missing visual fields, or stimuli that are too small or low contrast for the examinee to see clearly. For qualitative interpretation examples, please see Appendix 2.

Overall, visually-based tests are best interpreted as a minimum estimate of a visually impaired person’s functioning (Gallagher & Burnham, 2017). If scores are below the “average range” and there is reason to believe that vision played a role in lowering the score, it is best not to report or use those scores to create a composite with non-visually based scores. Results may be used, however, for qualitative purposes. If scores on visually-based tests are average or above, the examiner can be assured that the skill being measured is intact (Bylsma et al., 2004).

#### Guideline 6.3: Avoid tasks that require rapid processing of visual information in most cases or interpret with the visual impairment in mind.

Timed visual tests include rapid naming or measures of visual-motor processing speed. These tests are visually demanding, and performance varies by level of visual impairment (Groenveld & Jan, 1992). Enlarging these measures is likely to change the underlying construct, impact timing, and is not recommended. If the examiner chooses to administer a measure of visual-motor processing speed, it is not likely an adequate representation of mental processing speed but may be interpreted as a measure of how quickly the individual can manage a visually demanding worksheet. In addition, examinees with a visual field loss who have learned to scan properly across a page may still show scanning errors when pushed for speed on visual tasks (Engle et al., 2021).

### Topic 7: Adaptations and Modifications

#### Definitions

* Adaptations (or accommodations) are changes that do not alter the construct being measured and do not decrease or increase the difficulty level. Proper adaptations do not represent an unfair advantage; individuals could be unfairly penalized without the adaptation.
* Modifications are changes that alter the concept being measured or change the difficulty level.

#### Guideline 7.1: Plan adaptations and modifications based on the individual’s specific visual needs, and document accordingly in the report.

It is important to collaborate with the visual impairment specialist to develop a plan. Make decisions about adaptations and modifications based on the individual’s performance during the Functional Vision Assessment and Learning Media Assessment. When documenting adaptations and modifications, it is best practice to include enough detail so that another examiner can replicate any changes to standardization. For example, note the font type and size used for reading, the level of magnification, and what type of special lighting was used. Adaptations used during testing should be familiar to the individual and effective for providing access (Allman, 2009).

#### Guideline 7.2: Critically consider whether changes made to a test or how it is administered constitute an adaptation or a modification.

Common changes include the enlargement of visual materials, extra time on visual tasks, and the provision of an audio or braille format. Enlargement may be essential to make the visual material accessible. However, enlargement may make some tasks easier than the original task. For example, enlargement of tasks that require precise motor responses, such as staying within the lines, makes the task easier. Conversely, enlargement may also increase the working memory demands of a task, especially if all of the material cannot be viewed at once. Providing an audio format for a reading comprehension task may fit with the individual’s preferred learning medium but then compares the individual's listening comprehension to the reading comprehension of the standardization sample. Creating tactile representations for visual items is almost always considered a modification and should only be done in close collaboration with a visual impairment specialist. Allowing access to a brailler, calculator, or abacus on a mental math test when the measure intends to assess working memory would be a modification. Allowing access to a brailler or abacus for a paper and pencil math test would be an accommodation for students who typically use them for math. Verbally describing pictures on writing tests changes the intent of the task and would be a modification (Sattler & Evans, 2014). Providing an enlarged version of a picture on a test evaluating writing would be an accommodation.

#### Guideline 7.3: Do not interpret modified tests quantitatively, but results may be useful for qualitative purposes.

Modified tests often provide important information to help understand an individual’s strengths and challenges. When used in a diagnostic assessment, modified tests must be interpreted cautiously by an examiner skilled in working with this population and through a collaborative evaluation process. The qualitative information from the individual’s performance can inform recommendations for strategies, adaptations, and modifications in educational and vocational settings.

#### Guideline 7.4: Allow assistive technology or alternative ways of demonstrating skills while considering the impact on construct validity.

Individuals may be allowed to demonstrate skills using assistive technology or alternative methods to obtain an accurate measure of their current level of functioning. Interpretation of the results depends on whether the assistive technology or alternative methods are considered adaptations or modifications.

Examples of adapting tasks include using a brailler, abacus, braille notetaker, tablet, or laptop with a refreshable braille display to exhibit reading, writing, and math skills. Using an abacus is an appropriate accommodation for tasks that permit sighted individuals to use paper and pencil for calculations. Per *Making Tests Accessible for Students with Visual Impairments: A Guide for Test Publishers, Test Developers, and State Assessment Personnel, 4th Edition*,

The skills involved in reading braille, reading print, and listening to audio materials are unique to each medium. Therefore, during the development of test items, test publishers must be clear about which constructs are to be assessed by a particular item. If reading as a decoding skill is to be assessed, then a fair assessment can only result if the student is provided with material that can be visually or tactually read. If comprehension is the construct being assessed, then the test developer must determine whether reading comprehension or listening comprehension is the skill to be assessed. Comprehension would need to be defined to ensure that students are using appropriate accommodations when taking a particular test. (Allman, 2009, p. 62)

Assistive technology or alternative methods should not be utilized when they provide an unfair advantage (Allman, 2009). Using dictation software on timed writing tasks is often considered a modification but may provide useful qualitative information. Using text-to-speech or screen reading software on reading tasks is a modification as it changes the test from a reading task to a listening comprehension task.

#### Guideline 7.5: Review the content of questionnaires and interviews carefully and adapt items to ensure they are appropriate.

Before administration, review standardized and informal questionnaires for items that need to be adapted or modified to be appropriate. For instance, instead of asking about the use of eye contact, the question can be reframed to consider the individual’s orientation of their body and face towards the speaker.

Instruct raters to complete questionnaires considering the individual’s use of assistive technology, braille, or alternative methods of engagement or response (Harrison & Oakland, 2015; Sparrow et al., 2016). For example, it is permissible to consider the use of technology and braille if asking about reading and writing capabilities.

Using another person to facilitate skills is not generally acceptable. For example, if an examinee can read and write a few sentences in braille with support but needs assistance to complete functional braille tasks (e.g., reading labels for organization, following a recipe, creating a shopping list, or writing a thank you note), the individual would not be rated as independent in functional literacy skills.

### Topic 8: Evaluating Co-occurring Conditions

#### Guideline 8.1: Comprehensively evaluate individuals with visual impairments, including intellectual, communication, socio-emotional, motor, adaptive, and behavioral functioning.

It is important to evaluate individuals with visual impairments for co-occurring developmental/intellectual, socio-emotional/behavioral (Augestad, 2017; Kúld et al., 2021; Sims et al., 2021), motor (Bakke et al., 2019), and adaptive functioning impairments (Lewis & Iselin, 2002)**.**

There are multiple reasons why individuals with visual impairments may present with co-occurring conditions. Visual impairments may directly lead to impairments in other areas of development. For example, motor skills are often delayed in typically developing children who are blind (reviewed in Bakke et al., 2019). In addition, a genetic or neurological condition may be the underlying cause of both the visual impairment and the co-occurring condition. For example, extremely premature birth can lead to a cascade of complications which results in both intellectual developmental disorder and visual impairments (Blencowe et al., 2013). Individuals with visual impairments will also sometimes present with unrelated conditions. The remainder of this section provides key considerations in diagnosing co-occurring conditions in individuals with visual impairments.

#### Guideline 8.2 (autism): Become familiar with typical development in children with visual impairments before diagnosing autism in individuals with visual impairments.

Autism is more common in individuals with visual impairments than in the general population (Do et al., 2017; Fazzi et al., 2019). In some cases, there may be an underlying diagnosis that can explain both conditions. Examples of such diagnoses include, but are not exclusive to, optic nerve hypoplasia (Dahl et al., 2018; de Verdier et al., 2018; Parr et al., 2010), septo-optic dysplasia (Mann et al., 2023; Parr et al., 2010), retinopathy of prematurity (Chase, 1974; de Verdier et al., 2018; Ek et al., 1998), Leber's congenital amaurosis (de Verdier et al., 2018), anophthalmia/microphthalmia (de Verdier et al., 2018), and congenital rubella syndrome (Chess, 1971). There is also the risk that deprivation or differences in developmental experiences can lead to what looks like autism (Fazzi et al., 2007; Fraiberg, 1977).

Given these complicating factors, the examiner needs to have extensive knowledge of the normal developmental trajectory for individuals with visual impairments as there are some overlaps with autism, particularly in the early years (Butchart et al., 2017; Ludwig et al., 2022; Molinaro et al., 2020; Wrzesińska et al., 2017).

To learn more about this complex topic, examiners should review the tables in the article by [Ludwig and colleagues (2022)](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10072819/) for a detailed examination of the similarities and differences between visually impaired individuals with and without autism. Symptoms of autism are compared and contrasted to the typical development in children with visual impairments, including social-emotional reciprocity, nonverbal communicative behaviors, relationship development, stereotyped/repetitive movements, insistence on sameness, fixated interests, and sensory reactions. For example, Ludwig and colleagues (2022) note that echolalia can be common in both groups, but visually impaired children without autism use echolalia more often to foster social interactions. It is essential that the examiner is familiar with this information and consults with a visual impairment specialist in order to disentangle autism from features that are developmentally typical in visually impaired children.

#### Guideline 8.3 (deafblind): Acquire specialized knowledge and training before assessing individuals with co-occurring hearing and visual impairments.

The developmental impact of dual sensory impairments is best considered to be multiplicative rather than additive. Additional cumulative needs should be addressed when a student has a combination of visual and hearing impairment, which may not be present with only one sensory modality impairment. Working with deaf individuals may also require experience working with an American Sign Language (ASL) interpreter or a deafblind intervenor. For individuals within the school system, there is likely to be a teacher of the deaf/hard of hearing or deafblind specialist who can provide support in addition to the teacher of students with a visual impairment. For more information, see Chapter 3 in the [*Deafblindness Educational Service Guidelines*](https://www.nationaldb.org/media/doc/DESG_Final.pdf) (Riggio & McLetchie, 2008) and “[Cognitive Assessment of Children Who Are Deafblind: Perspectives and Suggestions for Assessments](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7544930/)” (Nicholas, 2020).

#### Guideline 8.4 (intellectual developmental disorder): Carefully consider the validity of both standardized cognitive tests and adaptive functioning measures when evaluating for intellectual developmental disorder.

When using tests of intellectual ability, the examiner must consider 1) the accessibility of visually-based materials, 2) the impact of adaptations and modifications on test results, and 3) the effect of limited incidental learning on an individual’s knowledge development. These considerations are explained at length in other areas of these guidelines. Understanding the limits of IQ scores is particularly important for visually impaired individuals. According to the DSM-5-TR (American Psychiatric Association, 2022), “IQ test scores are approximations of conceptual functioning but may be insufficient to assess reasoning in real-life situations and mastery of practical tasks” (p. 42).

In measuring adaptive functioning, the examiner must consider 1) measures of adaptive functioning are not designed to differentiate between limitations in functioning arising from cognitive impairments and limitations arising from motor or sensory impairments, 2) some items may be inappropriate or need to be adapted (e.g., allow for braille use) for the examinee with a visual impairment, and 3) individuals with a visual impairment who have intact cognitive functioning are more likely than their sighted peers to be rated lower in adaptive functioning (Bathelt et al., 2019; Greenaway et al., 2017).

#### Guideline 8.5 (specific learning disorder): Review various factors related to learning media and educational experience when assessing for specific learning disorders.

A DSM-5-TR diagnosis of a specific learning disorder requires that a sensory impairment not be the primary cause of academic difficulty (American Psychiatric Association, 2022). Vision can be a contributing factor, just not the primary cause of the difficulty. The vision and learning issues may be related to the same underlying condition (e.g., a genetic or neurological disorder). Special considerations in diagnosis include the need to evaluate the appropriateness of previous instruction, the provision of appropriate accommodations and materials for visual or tactile access, the impact of early exposure to print or braille, and the impact of dual media use. As discussed in the topic “special considerations in test selection and administration,” assessment using standardized tests transcribed into braille requires the involvement of a professional proficient in braille.

Vision problems may affect accessibility and ease of learning but are not the main cause of learning disabilities. Historical theories about visual perceptual problems causing dyslexia and other learning disabilities have been disproven (American Academy of Pediatrics [AAP] et al., 2009; AAP et al., 2014; Handler et al., 2011). Research and professional organizations for pediatrics, ophthalmology, strabismus, and orthoptics found that vision therapy is not an effective treatment for learning disabilities and advise against vision therapy use beyond convergence insufficiency management (AAP et al., 2009; AAP et al., 2014; Handler et al., 2011; Wang et al., 2022).

Research indicates phonological processing as a core underlying aspect of reading is universal regardless of whether reading braille or print (Veispak & Ghesquière, 2010; Emerson et al., 2009). In addition, several studies suggest that students with visual impairments have similar writing abilities and challenges as the general student population (Erin & Wright, 2011; Savaiano & Hebert, 2019). However, fluency is one area known to be directly impacted by visual impairments. Braille and large print readers read at a slower rate than fully sighted individuals (reviewed in Atkins, 2012). Therefore, a reading impairment selective to fluency (speed) in the visually impaired individual is likely to be directly related to their visual impairment and not reflective of an additional disability.

Math presents unique challenges to a student with a visual impairment (Steinbach, 2022; van Leendert et al., 2019). It is difficult to separate the impact of vision from a primary math difficulty as number sense is related to visual processes; however, “studies indicate that vision is not mandatory for the development of number sense and imply that there is much potential for acquiring mathematical skills without the need to rely chiefly on visual processes” (Steinbach, 2022, p. 2). Examiners must carefully consider the individual's educational history (e.g., instructional methods, format of materials, and adaptations made to provide access) when assessing challenges in math.

Corroboration of a disability should include reviewing a portfolio of student work over time to establish ecological validity (Bruce et al., 2016). With a portfolio review, it is essential to ensure that the examiner is reviewing the student’s independent-level work.

#### Guideline 8.6 (language disorder): Carefully consider functioning in natural environments and potential intervention needs when assessing language.

Youth with visual impairments are more likely to present with speech and language challenges than the general student population (Brouwer et al., 2015; Brouwer et al., 2023; Miner, 1963). Challenges with speech and language may be due to an underlying co-occurring condition. However, visual impairment may also directly impact language development. Typical communication development involves the integration of visual information with auditory information. Therefore, limitations to accessing visual information can potentially impact the development and refinement of communication skills (Andersen et al., 1984; Brouwer & Gordon-Pershey, 2021; James & Stojanovik, 2007; Mosca et al., 2015).

Reduced or lack of access to visual cues such as eye contact, facial expression, and body language can particularly impact pragmatic language development. Pragmatic language challenges may be present even in those with advanced linguistic skills during the school years (Tadíc et al., 2010). It is also important to examine the depth of vocabulary knowledge (beyond labeling), as youth may not fully understand the meaning of words. Areas to evaluate include understanding of semantic relationships and accurate word utilization in novel situations (Vervloed et al., 2014). Phonological awareness is another area that needs close monitoring and early intervention given the potential impact on literacy (Brouwer et al., 2023).

Consideration of a DSM-5-TR diagnosis of a language disorder is appropriate when language challenges are more than those typically associated with sensory loss (American Psychiatric Association, 2022). While it is impossible to identify precisely the expected impact of vision loss on language, a substantial impairment likely warrants diagnostic consideration. The CATALISE consensus guidelines provide an alternative option, with a diagnosis of either a developmental language disorder or a language disorder associated with a specific condition (Bishop et al., 2016). Regardless of the diagnostic criteria, intervening to support language development is essential. Social (pragmatic) communication disorder may also be considered if pragmatic language challenges result in functional limitations in the absence of intellectual developmental disorder or autism spectrum disorder (American Psychiatric Association, 2022).

## Conclusion

This document highlights the complexities, challenges, and essential components of evaluating individuals with visual impairments. New examiners must seek education and consultation to develop competence while collaboration with a visual impairment specialist is essential for all (even experienced) examiners. Examiners need specialized knowledge regarding the impact of visual impairments on an individual’s development, including the possible impact of visual impairment on social-emotional, cognitive, communication, motor, behavior, educational, vocational, and adaptive skills. Special consideration regarding adaptations and modifications, and their impact on test performance, must be considered. An approach that integrates multiple methods and various sources of data is key. Data from different sources should be considered together, especially where standardized test results do not align with other pieces of information.

The information in this document provides a foundation but does not go into sufficient depth to be the only source of learning on this topic. After reading this guidance document, examiners will need to gauge their level of competency in this specialized area of assessment and determine appropriate next steps. Examiners must seek professional development beyond this document to gain the prerequisite knowledge to assess individuals with visual impairment competently. For example, the examiner must understand the characteristics of the examinee’s specific visual condition as the visual impairment population is heterogeneous in terms of etiology, age of onset, visual functioning, and co-occurring conditions. The examiner must also be aware of respectful and inclusive ways to interact with individuals who are blind or have low vision. It is also important to consider the differences between medical, legal, and educational definitions of visual impairment, particularly for supporting individuals with access to services.

In summary, an accurate and meaningful assessment of individuals with visual impairments is possible. A proper assessment by a competent evaluator can be an essential step in developing educational programming, accessing community services, and clarifying diagnoses. This guidance document reflects the current status of best practice recommendations which may change as technology and research evolve.

## Appendix 1: RIOT Model Examples

### Why is the Student Behind in Reading?

| Records | Interviews | Observations | Testing | Impression |
| --- | --- | --- | --- | --- |
| Near visual acuity of 20/200 (stable). Light sensitivity. No other medical issues. Currently in 3rd grade. FVA/LMA: primary media is visual (large print, minimum 36 pt font; high contrast with increased line spacing), and secondary is auditory. Consistent attendance at school. Attended play-based preschool. General education reading intervention group in grade 2 (45 minutes 4 times a week). Direct and consult TSVI services to support classroom strategies, adapted media, assistive technology, and self-determination. Not meeting grade-level standards in reading; at grade-level standards in other areas. | Parents: Outside reading tutor in grade 2. Access to large print text on iPad at home. Loves listening to audiobooks. Tries to avoid reading homework. Social with no behavioral concerns.Teacher: Slow progress in reading accuracy, fluency, and comprehension using large print or digital format. Reading level: end of kindergarten to beginning of 1st grade. Likes biweekly reading buddy times. Volunteers to answer questions when texts are read aloud to the class. Focused and well-behaved in class. Reading intervention group teacher: Making slow progress. Good effort in small group activities but struggles with phonological tasks.  | Reading intervention: Participated in oral vocabulary tasks accurately. Successful with syllable deletion but difficulty with onset-rime deletion. Performance similar to peers in the intervention group.Homeroom: Independently managed digital text on iPad. Made random guesses reading aloud. Reading was slow and choppy. More challenges than peers. Testing: Friendly, able to work for 1 hour between breaks, motivated to do well, appeared frustrated with reading tasks (extra encouragement needed). Worked at 8-12” from materials, attempted to sound out letter by letter, errors included b/d reversal and difficulty with letter blends. | All testing used adapted large print and video magnification with high contrast for visuals.Standardized testing: average listening comprehension, oral vocabulary, and verbal reasoning and knowledge; low basic reading skills, reading comprehension, auditory memory, and speed of lexical access; very low phonological processing.Standardized parent/teacher questionnaires: No socio-emotional or behavioral concerns.  | The student has a specific learning disorder that is not primarily due to the visual impairment as evidenced by the limited response to intervention despite appropriate instruction and learning media provided. The low reading performance is related to auditory memory and phonological processing challenges. The challenges are not due to intellectual developmental disorder, speech language disorder, or attention deficit hyperactivity disorder.Specialized academic instruction in structured literacy is required with specific focus on phonological skills, phonics, and orthography. |

### Why is the Student Having Difficulty Establishing Social Relationships with Peers?

| Records | Interviews | Observations | Testing | Impression |
| --- | --- | --- | --- | --- |
| Blind from birth.Attends general education kindergarten class with a full-time assistant. Meeting grade level standards in all areas. Current IEP includes direct and consultation services from TSVI, O&M specialist, APE specialist, and SLP. History of early intervention services, including speech individually and in a small group with expressive and receptive language goals. Met 3 out of 3 goals.Prior SLP evaluation reports showed mild delays in expressive and receptive language and significant delays in pragmatic language. Attended some VI community events with family, such as beeping egg hunt and art events. | Parents: Siblings often talk for the student when with others. Initiates conversation and plays with parents and siblings but is more reserved in larger group settings. Comfortable chatting with known adults outside of the family. Tried to set up playdates with others with VI but had challenges due to distance.Teacher: The student is sweet but shy. Loves to chat 1-on-1 with staff but needs guidance and encouragement to interact with peers. Compliant, follows routine instructions well. Likes the tactile schedule and is very aware of what is coming next. No strong friendships.The student self-reported having many friends and named classmates. IA confirmed names were accurate, but the student does not play with them. | Classroom: Interacted primarily with the IA and teacher (used comments, labels, and requests). Peers approached the student; prompting needed to engage. Inconsistent in orienting the body towards communication partner; tended to hunch back with face turned downward. Recess: IA suggested playing a ball game with peers, but the student opted to sit on the perimeter and eat snacks throughout.Language sample: Needed prompting to add details (people, setting, and adjectives). Appropriate volume, prosody, tone, and articulation. Testing: Took time to warm up to the examiner. Had short back-and-forth conversations on familiar topics. Appropriate range of emotion. | Parent/teacher social skills checklists: Needs support for 8 of 10 preschool social skills; expressive language and receptive language below 4-year-old level.Boehm-3 Preschool Tactile Edition attempted but discontinued due to student’s lack of familiarity with tactile graphics. Informal testing with real objects indicated emerging concept development. Challenges with basic concepts appear related to limited exposure and experience. Support needed with spatial, quantitative, sequential, and temporal concepts.Standardized parent/teacher questionnaires: At-risk ratings on social skills and withdrawal from parent and teacher. No other socio-emotional or behavioral concerns.  | The challenges with social relationships are primarily due to a pragmatic language issue.The social challenges are not due to anxiety, autism spectrum disorder, or intellectual developmental disorder.Speech language therapy is required with direct instruction in social and pragmatic language skills. Encouraged to participate in regularly facilitated social activities for youth with VI.  |

## Appendix 2: Qualitative Analysis Examples

### Examples of Behavioral and Test Interpretation

The following are fictitious examples of implications drawn and recommendations made from qualitative analysis of behavioral and testing data.

| Areas Addressed | Behavioral and Test Interpretation Examples |
| --- | --- |
| Functional vision | Samantha, who has a highly restricted visual field (5 degrees), was able to complete all of the visual tasks but found the work extremely tiring. She required extra breaks, during which she chose to sit quietly with her eyes closed. In school, she will benefit from access to rest breaks throughout the day.  |
| Nonverbal reasoning | Carlos correctly completed some of the more difficult items on the WISC-5 spatial and visual reasoning tasks (Figure Weights and Visual Puzzles) but required about 50% more time than is allowed for testing purposes. His performance suggests that while complex visual tasks are very challenging for him, he can manage them with adequate time.  |
| Processing speed | Leila worked slowly and very carefully on measures of visual processing speed (WISC-5 Coding and Symbol Search). Leila has nystagmus (rapid involuntary movement of the eyes) and photophobia (extreme response to light) associated with albinism, and these typically cause her to need more time for detailed visual work. |
| Visual spatial processing | Stacey, who has a visual acuity of 20/70, had difficulty with visually-based tasks, even with enlargement. While she was able to see and identify the details adequately, she had difficulty with visual-spatial processing. Visual-spatial processing is different from visual acuity. Good visual-spatial processing allows a person to imagine objects from different perspectives and see in your mind’s eye how pieces of a puzzle might fit together. Stacey may need extra support with visual-spatial tasks, beyond enlargement. She would benefit from multi-modal instruction, particularly for tasks with a heavy visual-spatial component. |
| Auditory response time and information processing speed | Kwan, who has no light perception in his left eye and 20/600 in his right eye, had challenges with processing speed tasks that involved scanning rows of letters or numbers to identify and mark matching pairs. He was accurate but took more time than peers his age to complete brief, simple tasks involving paper and pencil (or marker). Although Kwan is transitioning to learning braille and tactile graphics, he prefers to rely on visual information. He needs to put the visual stimulus about one to two inches from his eye, significantly slowing his performance. On an auditory measure of processing speed (T.O.V.A. Response Time), Kwan demonstrated age-appropriate auditory processing speed. |
| Verbal comprehension and knowledge | Emir, who has optic nerve hypoplasia, performed within normal limits for his age on standardized assessments of verbal comprehension and knowledge (OPUS; RIAS-2 Verbal Intelligence Index; WJ IV Cognitive - Large Print Comprehension-Knowledge Cluster) as well as informal assessments (Johns Basic Reading Inventory Listening Comprehension). He can effectively take in verbal information, use words to compare and contrast ideas, and explain what he knows about a subject. While he was able to recall details that were directly stated, Emir had problems drawing inferences (i.e., thinking beyond what is directly stated in the passage). His difficulty with making inferences may be due to the need for explicit instruction in this area, which is not unusual for children with visual impairments. |
| Reading | Enoch is a nine-year-old with no light perception. He demonstrated reading skills at the kindergarten level on the Brigance CIB II Braille. He made errors when reading the letters d/f, e/i, h/j, m/u, and p/v, which are common braille reversals for students at the initial stages of learning braille. His listening comprehension exceeded his reading level and was at a third-grade level based on his performance on the Brigance CIB II Braille. His testing performance is consistent with teacher reports and observations. Enoch generally understands auditory instruction of grade-level content. Reading instruction and materials in braille should address basic reading skills at a kindergarten level.  |
| Mathematics  | Angelica was accurate with basic addition, subtraction, and multiplication facts. Her response was slow due to the braille format and her insistence on reading every problem aloud. Later, in informal testing, the test items were presented orally; her speed increased substantially. Angelica’s ability to apply her computation knowledge to real-life problems was in the Very Low range indicating that while she has memorized math facts, she does not always have a solid understanding of what they mean or how to apply them. She will benefit from practice with the application of math concepts, including the application to real-life situations. |
| General knowledge and reasoning | Jules, who is blind, has a strong verbal memory and can easily learn and remember names, facts, dates, and places in his daily life. However, he has significant difficulty with understanding abstract concepts and is very limited in generalizing what he has learned to new situations. Moreover, limited exposure to experiences typical for sighted peers has delayed his development of general knowledge. He will benefit from experiential learning opportunities (i.e., learning by doing) and exposure to a wide variety of concepts and ideas to help broaden his knowledge. |
| Academic achievement and learning media | Steve, a teenager with 20/200 visual acuity (with a risk for further decline), has always needed extra support for learning. He has been learning braille with limited progress since first grade. His reading, writing, and mathematics progress has been slow despite extensive academic support, a strong work ethic, and good attention to task. With most cognitive abilities close to age level (low average) and specific challenges with short-term memory, number sense, and processing speed, Steve meets DSM-5-TR criteria for specific learning disorders in reading, writing, and mathematics. He will continue to need intensive support to progress in school, with a focus on auditory access to information and speech-to-text for writing. An auditory format is recommended over braille, as Steve is likely to have the same difficulty with braille as with print. His difficulties with reading are primarily related to a learning disorder and not secondary to problems with visual access. |

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## Appendix 3: Resources for Further Learning and Connection

### Databases for Etiologies of Vision Loss

The etiologies of visual impairment are wide-ranging and include (but are not limited to) the following: [achromatopsia](https://eyewiki.aao.org/Achromatopsia#:~:text=Achromatopsia%20is%20a%20rare%2C%20bilateral,severe%20loss%20of%20color%20discrimination.), [albinism](https://www.ncbi.nlm.nih.gov/books/NBK519018/), [aniridia](https://rarediseases.org/rare-diseases/aniridia/), [anophthalmia/microphthalmia](https://www.nei.nih.gov/learn-about-eye-health/eye-conditions-and-diseases/anophthalmia-and-microphthalmia#:~:text=Anophthalmia%20is%20when%20a%20baby,born%20with%20anophthalmia%20or%20microphthalmia.), [cataracts](https://www.aao.org/eye-health/diseases/what-are-cataracts), [congenital optic nerve anomalies](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4314572/), [optic nerve atrophy](https://eyewiki.org/Optic_Atrophy), [optic nerve hypoplasia](https://rarediseases.org/rare-diseases/optic-nerve-hypoplasia/), [septo-optic dysplasia](https://rarediseases.info.nih.gov/diseases/7627/septo-optic-dysplasia-spectrum), [cortical/cerebral visual impairment](https://www.perkins.org/what-is-cvi/), [diabetic retinopathy](https://www.nei.nih.gov/learn-about-eye-health/eye-conditions-and-diseases/diabetic-retinopathy#:~:text=Diabetic%20retinopathy%20is%20an%20eye,at%20least%20once%20a%20year.), [glaucoma](https://www.nei.nih.gov/learn-about-eye-health/eye-conditions-and-diseases/glaucoma#:~:text=What%20is%20glaucoma%3F,a%20comprehensive%20dilated%20eye%20exam.), [juvenile macular degeneration](https://www.aao.org/eye-health/diseases/juvenile-macular-degeneration), [retinitis pigmentosa](https://rarediseases.org/rare-diseases/retinitis-pigmentosa/), [retinoblastoma](https://www.cancer.org/cancer/types/retinoblastoma.html), [retinopathy of prematurity](https://www.aao.org/eye-health/diseases/what-is-retinopathy-prematurity), and [trauma (eye injury)](https://www.ncbi.nlm.nih.gov/books/NBK470379/#_article-21506_s6_). Further information about these and other etiologies of vision loss can be found in the following databases.

* [American Academy of Ophthalmology - EyeWiki](https://eyewiki.aao.org/Main_Page)
* [American Association for Pediatric Ophthalmology and Strabismus - Eye Terms & Conditions](https://aapos.org/patient/eye-terms)
* [National Center for Biotechnology Information Bookshelf - StatPearls](https://www.ncbi.nlm.nih.gov/books/NBK430685/)
* [National Institutes of Health: Genetic and Rare Diseases Information Center](https://rarediseases.info.nih.gov/diseases?category=&page=1&letter=&search=)
* [National Eye Institute - Eye Conditions and Diseases](https://www.nei.nih.gov/learn-about-eye-health/eye-conditions-and-diseases)
* [National Organization for Rare Disorders - List of Rare Diseases](https://rarediseases.org/rare-diseases/)

### Assessment Resources

* [Making Evaluation Meaningful](https://www.tsbvi.edu/store/making-evaluations-meaningful) is a book by Marnee Loftin (2022) intended to provide guidance to evaluation personnel, teachers of students who are visually impaired, and families in making the best possible decisions regarding student evaluation.
* [Psycho-educational Assessment in Children with Visual Impairments](https://learninghub.phsa.ca/Courses/26700) is a free online course (registration required) designed for psychologists with expertise in the psycho-educational assessment of children and adolescents. This course has additional information for Teachers of Students with Visual Impairments who are supporting psychologists and may be useful to other assessment professionals.
* [Psychoeducational Evaluations of Students with Visual Impairments](https://docs.google.com/document/d/1iMO30k9yONTlje_t-cv_rOGamb94rKf1Mbmb-egiE1k/edit?usp=sharing) includes lists of tests that can be used with students who are blind or have low vision (in Appendix A), such as tests available in braille and large print.

### General Visual Impairment Resources

* [Perkins eLearning Resources](https://www.perkinselearning.org/) has extensive opportunities for online learning including podcasts, videos, and articles.
* [Texas School for the Blind](https://www.tsbvi.edu/) has extensive resources and online learning opportunities.
* [Paths to Literacy for students who are blind or visually impaired](https://www.pathstoliteracy.org/) has many excellent resources for parents, educators, and assessors on reading, writing, and math.

### Cortical/Cerebral Visual Impairment (CVI) Resources

* [PaTTAN CVI Course](https://cviscotland.org/mem_portal.php?article=236) is a series of webinars that progress from foundational information about children with CVI through assessment methods and interventions.
* [CVI Self-Paced Short Course](https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fclassroom.google.com%2Fc%2FNTI4ODY2NjIyNjgz%3Fcjc%3D265c263&data=05%7C02%7Cmnguyen%40csb-cde.ca.gov%7Ca5170fbf09f24786b03b08dc479467ca%7C5d964075ab42404a9eb89d12b2ae2de9%7C0%7C0%7C638463949946660085%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=Lk3cQiozeXqN2duDyM0jEbAR0yP%2BmY2xQbq33zpZWLk%3D&reserved=0) (registration with a Google account is required) is a free online course about CVI, including information about causes, characteristics, screening tools, assessments, and report writing.
* [Pediatric Epilepsy Surgery Alliance](https://epilepsysurgeryalliance.org/) provides educational resources including, “Vision After Hemispherectomy, TPO Disconnection, and Occipital Lobectomy: An Introductory Guide” and “Helpful Educational Strategies For Children With Homonymous Hemianopsia.”

### Connections with Colleagues

* [Council of Schools & Services for the Blind](https://cosbvi.org/schools-for-the-blind/) includes links to schools and agencies that serve children who are blind or visually impaired in the United States.
* [APH ConnectCenter Directory of Services](https://aphconnectcenter.org/directory/) contains information for organizations and agencies that serve people who are blind or visually impaired in the United States and Canada.
* [BVIPsych Listserv](https://forms.gle/d3YB3U2NpUCcUJ2p8) is an email listserv connecting psychologists who assess and provide services to individuals with visual impairments.
* The [NASP Interest Group](https://www.nasponline.org/membership-and-community/member-benefits/nasp-interest-groups), BVIPsych: School Psychology Services for Students Who Are Blind or Visually Impaired, is available for NASP members.

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