WISC–V DIGITAL ADMINISTRATION AND SCORING

This chapter describes and illustrates the digital version of the WISC–V on Q-interactive™, a digital assessment platform developed by Pearson. The digital version involves administration of the test using the Q-interactive app, Assess, on two tablet devices that replace the stimulus books and Record Forms. It contains features such as flexible programmed administration guidelines and basic scoring output. This chapter discusses potential clinical applications and digital enhancements relevant to specific clinical groups.

DIGITAL ASSESSMENT ADVANTAGES AND CHALLENGES

There are a number of advantages to digital assessment. The digital medium offers bidirectional feedback, improved visual presentation, and access to constructs impossible to assess in traditional modes (e.g., reaction time). Experimental design can be more readily controlled in the digital format, with tighter standardized presentation and reduced administration errors. Scoring is immediate, clerical errors are eliminated or greatly reduced, and unique types of data (e.g., response time by item) are available (Noyes & Garland, 2008). Other practical advantages include greatly enhanced portability, reduced physical storage space, and potentially reduced costs of assessment (Schroeders & Wilhelm, 2010). With Q-interactive, as long as items were scored as they were administered, postadministration scoring time is completely eliminated, which

offers the practitioner precious minutes back in his or her day.

Despite these advantages, digital assessment also is subject to some challenges. Hardware and software can freeze or crash, sometimes resulting in lost data. Some studies indicate working in a digital format results in relatively greater fatigue, compared with a traditional format. In addition to fatigue, the medium's flexibility can create issues: Progression through items can be more cumbersome. New confidentiality issues must also be considered and worked through when testing in a digital medium (Noyes & Garland, 2008).

EQUIVALENCE OF TRADITIONAL AND DIGITAL MEDIUMS

The equivalence of paper-and-pencil (i.e., traditional) and digital testing mediums has been examined across a variety of ability tests. In general, the impact of testing medium appears to be small in the general population. Mead and Drasgow (1993) found differences across mediums that varied from little to no difference for power tests, to moderate for speeded tests. However, Kim (as cited in Schroeders, 2008) conducted a subsequent meta-analysis with a larger sample of studies that adjusted for within-study dependency of effect-size estimates and found no such differences.

Recent studies of specific ability tasks have found no performance differences across mediums (Schroeders & Wilhelm, 2010; Williams & McCord, 2006). Concerns have been raised

about technology proficiency, computer literacy, technological self-efficacy, and computer comfort/anxiety. Recent studies of specific ability tasks that investigated the interaction of technology-related variables such as computer anxiety with format and demographic variables have found no interaction effect on performance (Schroeders & Wilhelm, 2010; Williams & McCord, 2006). With the increased exposure of society to technology, these issues may have even less impact in the future (Williams & McCord, 2006).

Equivalency studies are complete for the WISC–V (Daniel, Wahlstrom, & Zhang, 2014) as well as the Wechsler Adult Intelligence Scale–Fourth Edition (WAIS–IV; Wechsler, 2008), the Wechsler Intelligence Scale for Children–Fourth Edition (WISC–IV; Wechsler, 2003), and a number of other Pearson products (Daniel, 2012a, 2012b, 2012c, 2013). It is important to note that the initial digital adaptations of these tests represent conservative levels of modification. These adaptations do not eliminate all manipulatives and do not require all examinee responses to be digitally captured. Rather, they merely present the stimulus books on a tablet and involve examiner recording, scoring, and item advancement on a second tablet that provides reminders about the basic administration rules.

At present, some materials of the Q-interactive version are not digital. The Block Design blocks are used in the traditional manner. Also, at the time of this writing, paper-and-pencil response booklets are used for administration of the Processing Speed subtests; only administration instructions and scoring of the data are available in Q-interactive. An initial attempt was made to adapt these subtests for digital responses, but the data did not support the inclusion of those first versions. The development effort continues at present, with hopes of publishing fully digital versions of the Processing Speed subtests in 2016. These adaptations will likely show differences from the traditional versions and require equated norms.

TESTING SPECIAL AND CLINICAL POPULATIONS

The WISC–V represented the first effort to collect data for special and clinical group studies in Q-interactive. The *Standards for Educational and Psychological Testing* (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014) describe the collection and presentation of evidence about how a target construct may be altered (or not altered) by varying administration format. Accordingly, data were collected from a number of special and clinical group populations, and comparison studies were conducted with nonclinical children who took the digital version serving as the matched controls. One report on the results with an intellectually gifted group and with an intellectual disability group is available at the time of this writing, with others forthcoming at www.helloq.com/research.html. The mean scores of these groups as well as the effect sizes of the mean differences relative to nonclinical matched controls indicated that children who are intellectually gifted and children with intellectual disability–mild severity perform consistently regardless of format (Raiford, Holdnack, Drozdick, & Zhang, 2014).

Other questions about testing in a digital format center on examinee behaviors, engagement, and attention, particularly on the part of younger examinees or those from clinical populations. Recent survey research conducted with WISC–IV Q-interactive users (N = 95) indicated that examinees from various clinical populations as well as those who were younger (aged 5–9) most often appeared more engaged, attentive, focused, interested, and willing to respond when tested with the digital version compared to the traditional.

A frequent concern expressed is that children with attention-deficit/hyperactivity disorder (ADHD) may be less attentive to the digital format. For 77 respondents who rated children

with ADHD, 57% reported they saw a difference in these children's responses to the digital versus the traditional format. Of those, 82% indicated children with ADHD were more attentive, 9% indicated they were less attentive (i.e., 5% of the original sample), and 9% said the effect was neutral or inconsistent (Daniel, 2013).

For children with autism spectrum disorders, developmental delays, intellectual disability, and learning disability, most frequently practitioners indicated they saw no difference in level of engagement between formats. For those who did report a difference (fewer than half of respondents for every clinical population), a great majority indicated greater levels of engagement or a neutral effect. Across all respondents who rated these special populations, none rated examinees as less engaged with the digital as compared with the traditional format. A small proportion of this sample (7%) reported any difficulties using Q-interactive to test children with specific clinical issues (Daniel, 2013).

Nonetheless, when a test is adapted for a digital format, the two versions should be examined to determine if the scores obtained in the digital format can be interpreted in the same manner (Hambleton, Bartram, & Oakland, 2011; International Test Commission, 2006). Shifts in the scores obtained might occur, resulting in the need to equate the scores across mediums. Therefore, before a test is commercially available on Q-interactive, new types of subtests and subtests not yet proven equivalent for a particular age group undergo equivalency studies to confirm that the Q-interactive scores are interchangeable with those of the traditional medium.

ADMINISTRATION OF THE WISC–V ON Q–INTERACTIVE

Using the Q-interactive version of WISC–V, this section reviews the web portal and provides samples of administration and scoring features within Assess. Basic scoring output is illustrated. Potential clinical applications and digital enhancements relevant to specific clinical groups are discussed.

The current technical requirements for Q-interactive are listed in Quick Reference 4.1. Information relevant to data security and HIPAA requirements is available on the Q-interactive website (at the present time, http://www.helloq.com).

Q–interactive Web Portal

A secure web portal, Central, serves as the hub of all activities. Central can be used to create examinee profiles (i.e., enter demographics and referral questions), choose subtests to administer from the WISC–V and a variety of other instruments, review scores, and check usage figures. Figures 4.1 and 4.2 illustrate portions of Central

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QUICK REFERENCE 4.1: Q–INTERACTIVE TECHNICAL REQUIREMENTS

- Computer with Internet access through a standard browser (e.g., relatively current versions of Microsoft® Internet Explorer®, Firefox®, Chrome®, or Safari®), with iTunes installed
- Two (2) Apple iPads® (iPad 2 or newer) current on iOS, with at least 16 GB of memory, and with iTunes installed
- Wi-fi, 3G, or better/comparable connectivity
- Two antiglare screen covers
- Power cords to recharge iPads
- Examiner stylus for verbatim recording
- Current Assess app installed on each iPad

that facilitate creation of new examinees (i.e., clients) and transfer of cases to and from the Assess app on the tablet device. Support and training is also available via Central on the Support tab. Figure 4.3 illustrates portions of the training options that can be accessed through the Support tab.

Sample Administration and Scoring Features

During WISC–V administration on Assess, two remotely connected tablets replace the stimulus books, Record Form, and stopwatch. At the present time, the *WISC–V Administration and Scoring Manual*, Block Design blocks, and response booklets used for the traditional version are also used for the digital version. The *WISC–V Administration and Scoring Manual*, the *WISC–V Administration and Scoring Manual Supplement*, and the *WISC–V Technical and Interpretive Manual* are available in viewable, but not printable, .pdf format on Central.

Practitioner Tablet Functions

The practitioner tablet permits the examiner to view basic item verbatim instructions (typically only the verbatim instructions and essential prompts) to read aloud. Timing, recording, and most scoring functions are accomplished by touching a series of buttons. Typical buttons that appear on the examiner's (i.e., practitioner's) screen for many subtests are illustrated in Figure 4.4.

Basic administration information is accessed through the use of a few buttons. The information button produces a popover with abbreviated administration directions that are roughly equivalent to the paper Record Form abbreviated
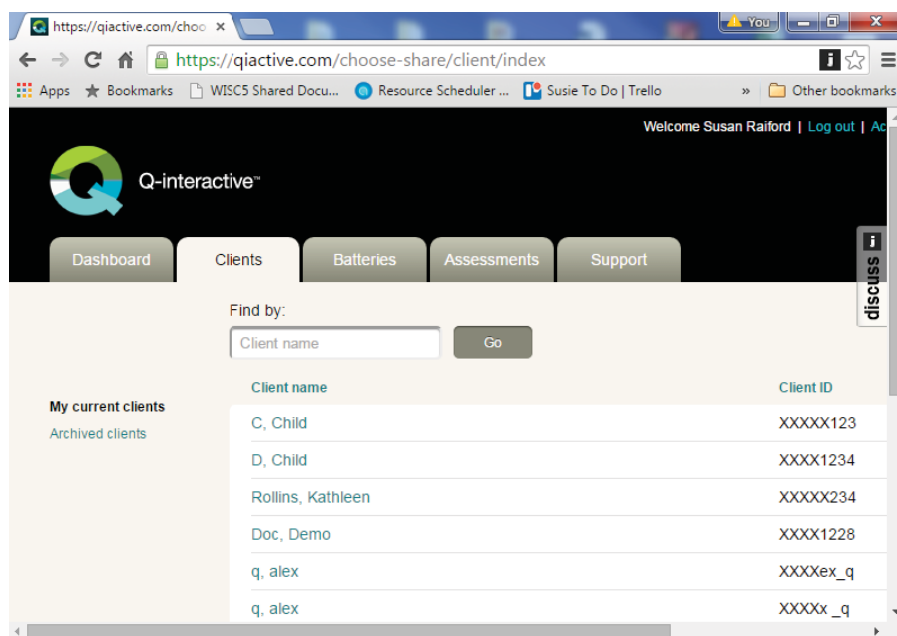

Figure 4.1   Clients List on Central   *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).
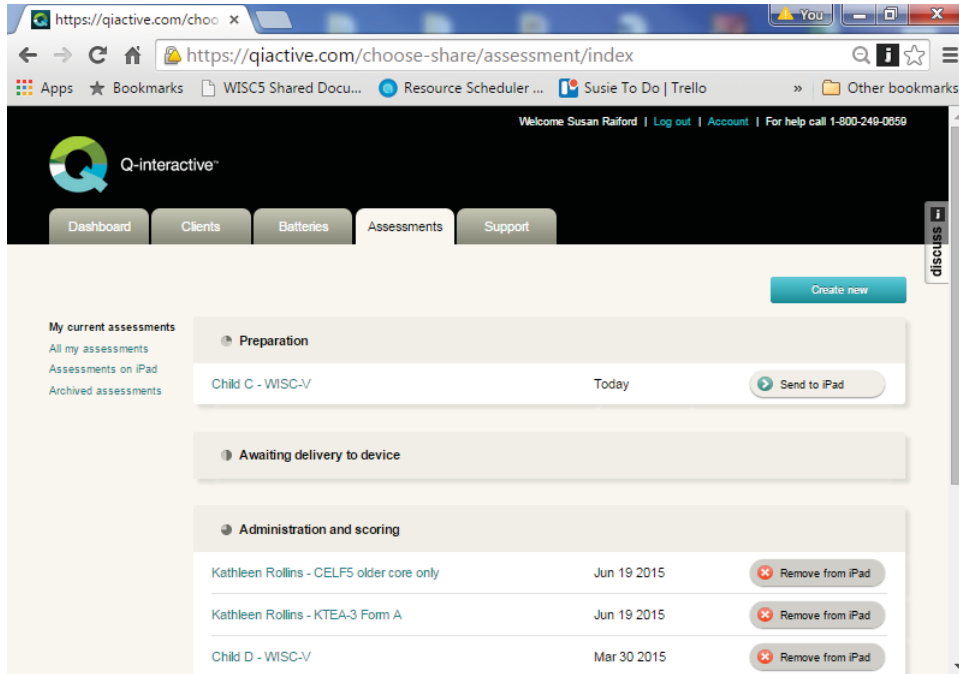
Figure 4.2   List of Assessments (Clients with Batteries Assigned) on Central *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).

instructions and limited portions of the *WISC–V Administration and Scoring Manual* General Directions sections. The instructions button produces a popover with verbatim prompts and any other important instructions that could be relevant during item administration. The home button can be used to suspend testing and make edits to the battery or view results from other completed subtests. The discontinue button permits a manual discontinue and can be used at most times during administration, even if the discontinue criterion has not been met.

Timing can be started and stopped, and completion times can be adjusted if necessary, using the stopwatch button. For subtests with time limits, the time readout turns to red font to warn the examiner that time has expired or is close to expiring.

There are a number of contextual event buttons that the examiner can use to record various behaviors of interest and to obtain raw process scores based on their occurrence (e.g., rotation errors on Block Design, Don't Know responses on Verbal Comprehension subtests). This is a helpful aspect of the digital version because these observations can be recorded and neatly summarized without additional effort at the end of each subtest. The notes button produces a popover where the examiner also may record other observations or notes about any item or subtest.

Some subtests have features specific to a subtest or subtest type that facilitate recording observations. Block Design provides an example. In the response grid, the blank squares may be touched repeatedly to indicate sides of the block that face up in the examinee's response (red, white, or red and white). The grid may be rotated
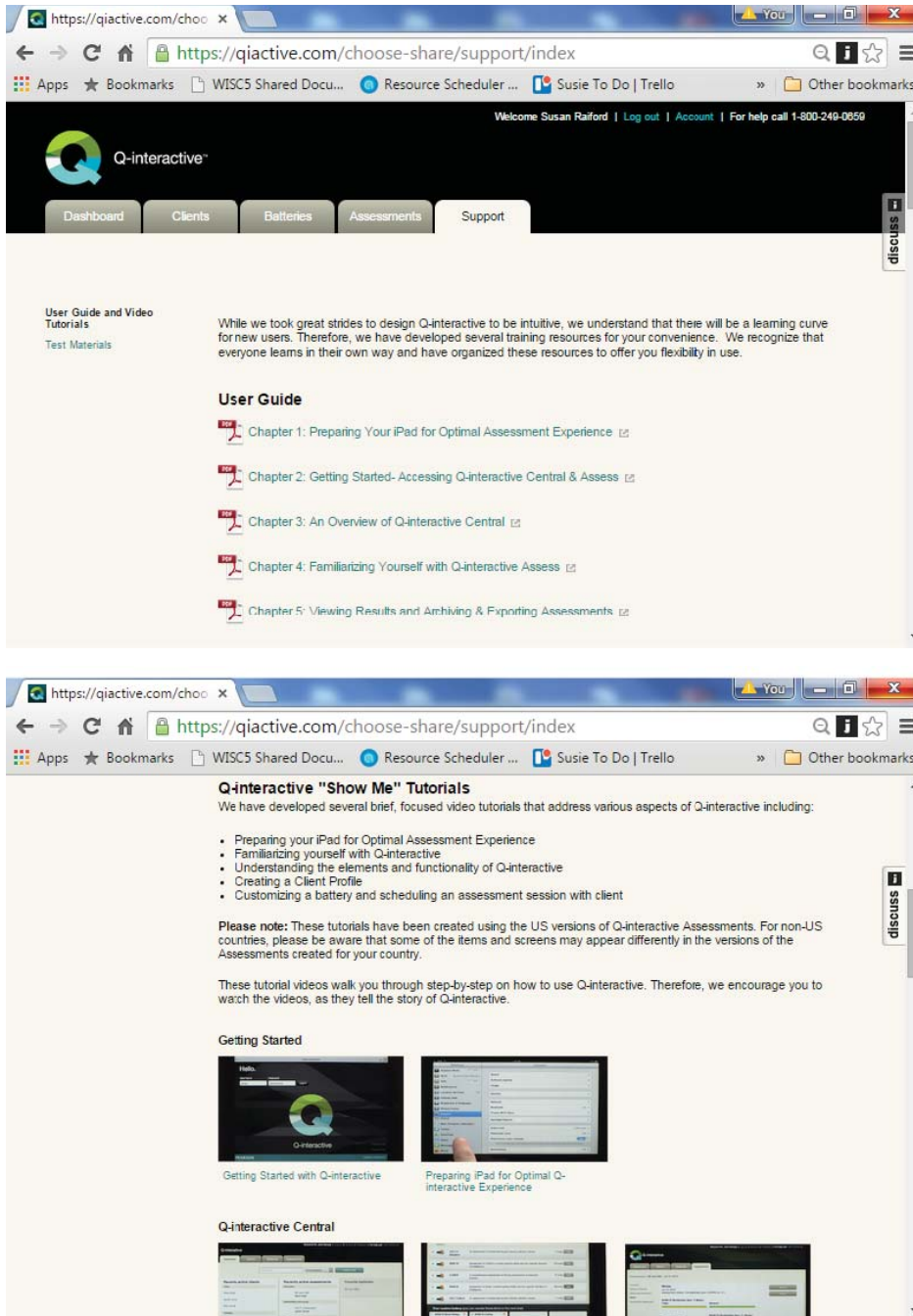
Figure 4.3 Tutorials and Training in Central *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).
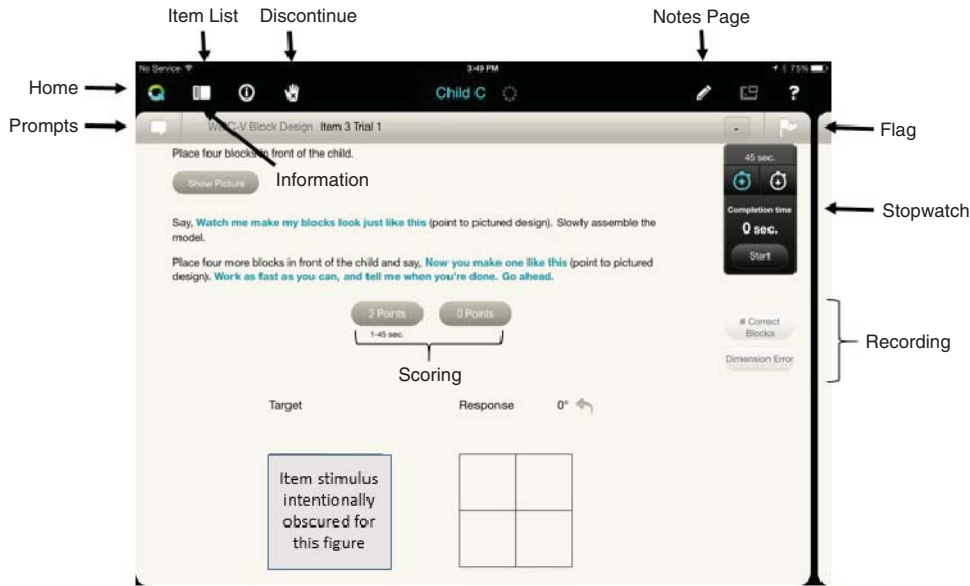
Figure 4.4   Typical Assess Buttons on Practitioner's Screen   *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).
Note: The item stimulus typically appears on the practitioner's screen but has been intentionally obscured to prevent revealing the item content. The blank grid appears to the right of the item and is not obscured as it does not reveal item content, but only a grid configuration used for recording.

by touching it with two fingers and rotating them in a clockwise or counterclockwise motion, until the desired degree of rotation is visible.

The scoring buttons facilitate assigning the indicated points to a response. The Flag button can be used by the examiner to indicate an open scoring question or some other item-level occurrence. In the rare event where item-level scoring is delayed for additional consideration (e.g., unusual response to a Verbal Comprehension subtest), items can be scored later or a different score can be assigned at a later time. The to-do list permits the examiner to edit scores at any time (even after the battery is complete). An unscored items indicator (i.e., a circled number) appears overlapping the to-do list button to specify the number of administered items awaiting scores (if any).

Some unique features appear on the practitioner's screen for Verbal Comprehension items, and these are illustrated in Figure 4.5. This figure also illustrates a few additional features that appear on Verbal Comprehension items as well as other items and subtests.

Items and subtests are organized within Assess as a series of cards, not unlike many e-reader apps. Similar to those apps, advancement is accomplished by "swiping." In Figure 4.5, a sliver of the next card is visible on the far right, as a reminder to swipe to the next card when the current activity is complete.

When a score is indicated, the Score indicator displays the selected score. The Score indicator is visible on almost every card of every subtest.
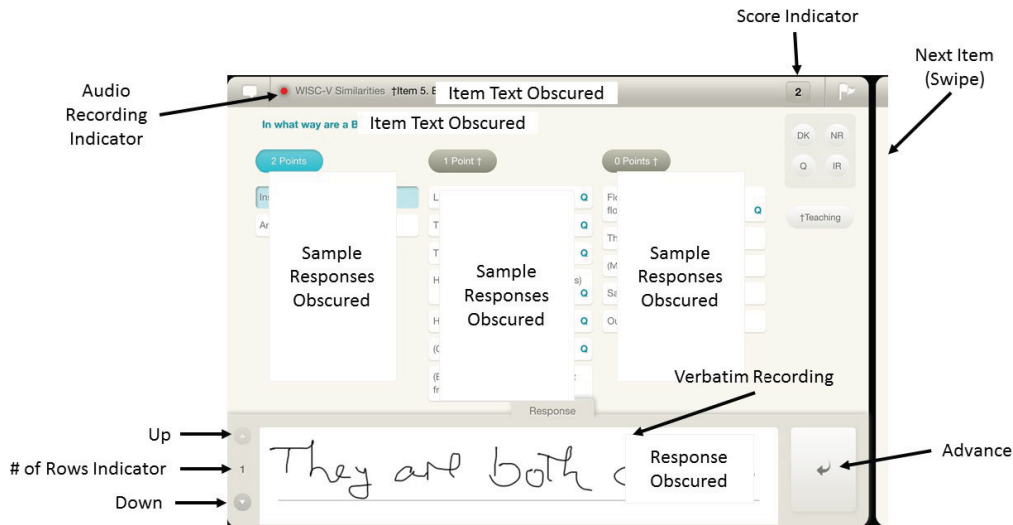
Figure 4.5 Typical Assess Features on Practitioner's Screen for Verbal Items *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).

For Verbal Comprehension items, Sample Response buttons can be touched to indicate if a response was given that closely matches the examinee's response. In this example, the third button from the top (in the column under 2 Points) is selected. Sample Response buttons do not result in scores automatically being assigned; in this example, the examiner assigned 2 points to the response using the 2 Points button.

Audio recording can be enabled or disabled. When enabled and functioning, the audio recording indicator is alight in red in the upper left of the current card.

A verbatim recording area permits handwriting capture so that responses can be recorded verbatim. An advance button provides clean space within the verbatim recording area and is analogous to the "enter" button on a standard keyboard. Following complete recording, the entire response is still viewable by using the up and down buttons on the left of the verbatim recording area. The rows indicator lists the number of rows used in the verbatim recording area.

The Attention box discusses some issues to be aware of when using the sample response buttons and audio recording.

Attention

Although audio recording is a helpful feature, the examinee's response should not be replayed during administration unless you use headphones, as this is inconsistent with standard administration. Remember that consent should be obtained to record the examinee if audio recording is enabled. At the present time, if the "transfer" feature is used to transfer the case from Assess to Central, all audio files are destroyed. If the "sync" feature is used, however, the audio files are maintained on the tablet.

Employ caution when using the Sample Response buttons without audio recording, because many of the buttons contain

multiple responses that do not share identical meanings, and data loss could result if audio recording is not engaged and responses are not recorded verbatim.

We recommend continuing to record verbatim responses in written form so that they may be compared with the sample responses to determine if a query is necessary and the response can be scored, and to avoid inadvertently discontinuing prematurely.

Assess monitors administration automatically, and a series of alert popovers provide reminders of standard administration rules (i.e., start, reversal, discontinue, timing) and are used to confirm that some indicated action was intentional (e.g., swiping backward to the previous item). The examiner can choose to follow the standard administration rules or to override them (e.g., to test the limits, select a different start point from the standard, or extend the administration time for an item or subtest). Samples of typical alert popovers that appear on the practitioner's screen for many subtests are illustrated in Figures 4.6 to 4.8. Note that in the interest of space, not every possible alert popover is included.

Attention

Swiping backward presently only permits administration of the item prior to the one currently being administered. The to-do button permits you to return to previous items to edit scores; however, visual stimuli cannot be exposed through this button. Therefore, for examinees who do not start with Item 1, currently you must immediately assign accurate scores to the start point items for all subtests with visual stimuli that are presented on the client device (i.e., every subtest except for the Processing Speed subtests).
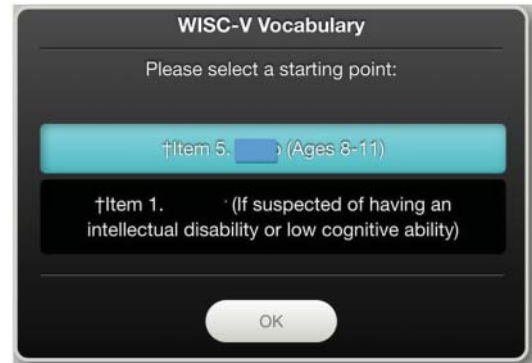

Figure 4.6 Assess Start Popover on Practitioner's Screen
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Note: The examiner is asked to select either the age-appropriate start point or Item 1. In this example, the examiner touched the Start Point button for Item 5 on the Start popover. Touching the OK button following this selection advances the app to the sample item, then subtest introductory text, then Item 5.

If you leave these items unscored and swipe forward more than a single item or assign perfect scores then later edit the scores in the Item List popover, Assess does not allow you to expose the visual stimulus for the reversal items. While this should not occur often in a standard administration, it is helpful to remember that you must score these start point items accurately and immediately.

Within Assess, other popovers appear when particular buttons are touched. These popovers operate as storage space for the text of administration directions, prompts, and teaching text. Samples of typical text popovers that appear on the practitioner's screen are illustrated in Figures 4.9 and 4.10. In the interest of space, not all types of text popovers are illustrated.
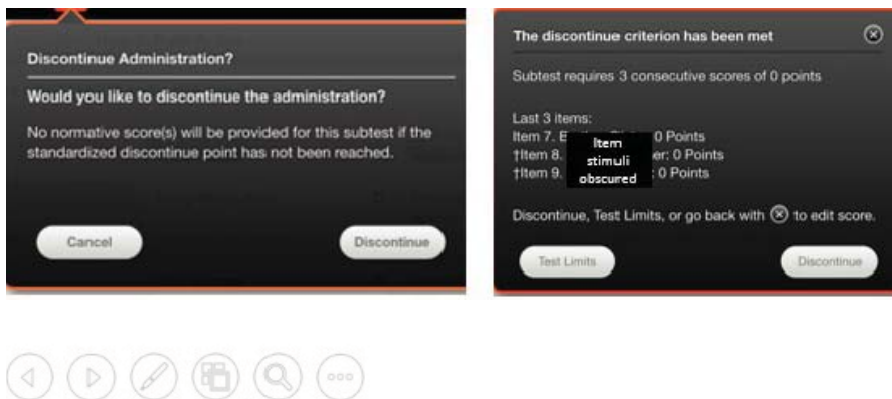
Figure 4.7   Assess Discontinue Popovers on Practitioner's Screen   *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).
Note: In the first discontinue popover example on the left, the examiner initiated a manual discontinue using the discontinue button. The popover alerts the examiner that the discontinue criterion has not been met because 2 points were awarded for Item 9 and no score was assigned to Item 10. In the second discontinue popover example on the right, the app detected that the discontinue criterion has been met according to the assigned scores of 0 points on Items 10 and 11. In either case, the examiner may choose to discontinue by touching the discontinue button on the popover, test the limits by touching the test the limits button, or edit the assigned scores using the X button on the upper right of the popover.

Touching the Information button produces the Information text popover. The Information text popover provides basic information relevant to administration and scoring. It is roughly equivalent to the Record Form icon bar for each subtest. The left panel shows the text that is visible when this particular Information popover appears. The left panel also illustrates that scrolling downward (by touching the popover with your finger and dragging it upward) reveals additional text within the popover.

Touching the Instructions button produces the Instructions text popover. This popover contains abbreviated versions of verbatim prompts that apply to the subtest in general and sometimes other abbreviated responses to examinee behaviors.

Practitioner–Client Device Interaction

The practitioner's screen displays various aspects of the examinee's (client's) responses if the subtest is one that permits examinee responses to be indicated using the client's screen. Various actions on the practitioner's screen produce the necessary stimuli on the client's screen. Figures 4.11 and 4.12 illustrate some of these features.

The practitioner's screen permits the examiner to initiate stimulus exposure on the client's screen using a button. Currently this button is labeled Show Picture. In most cases, verbatim instructions to be read aloud as well as other abbreviated instructions relevant to administration appear on the administration card. Beginning with the WISC–V, almost all subtests present the items using a single screen where stimuli
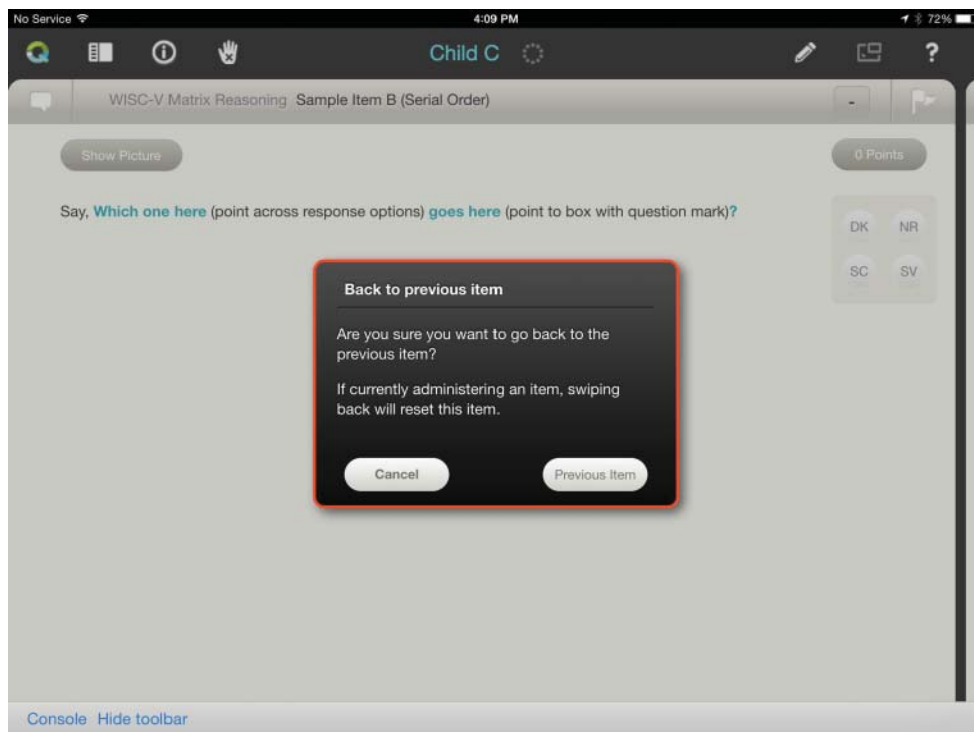
Figure 4.8   Assess "Swiping Backward" Popover on Practitioner's Screen   *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).
Note: This swiping-backward popover warns the examiner that swiping backward resets all associated values for the current item (e.g., score, timing, recording).

can be exposed, all instructions are available, and performance can be recorded.

The practitioner's screen serves to permit the examiner to indicate similar information to that typically written on the Record Form. Many of these functions were illustrated previously in Figures 4.4 and 4.5, which depict other types of items. In the example illustrated in Figure 4.12, the interaction between the two tablets is evident in the Client View preview. If the examinee selects a response, it is highlighted. Because the examinee may also choose to respond verbally by saying the letter corresponding to the indicated response, the examiner also may touch the Client View preview to indicate the examinee's response. Occasionally sample and teaching items include Show Picture buttons that are used when providing feedback for an incorrect response.

This chapter provides various subtest screen examples, but similar and thorough training videos for each type of subtest are also available on the Q-interactive site's "Support" tab. The
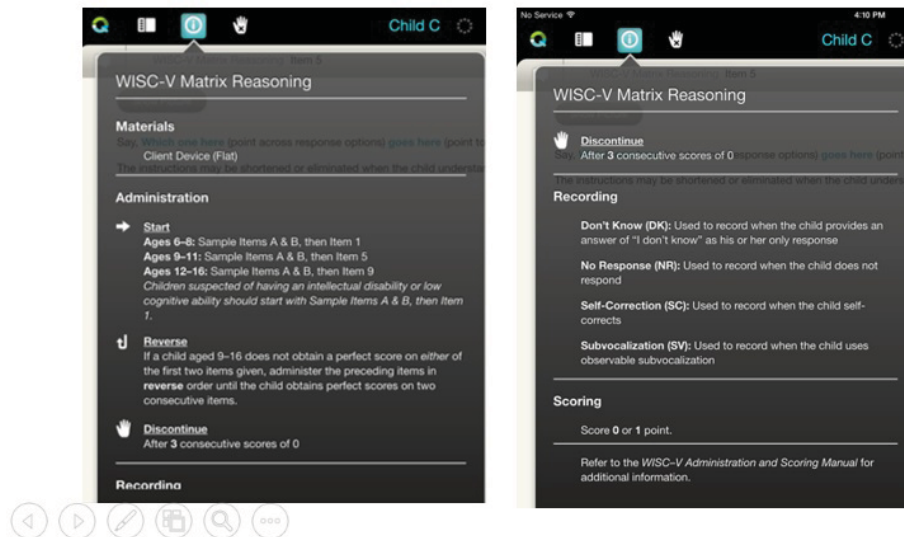
Figure 4.9 Information Text Popover on Practitioner's Screen *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).
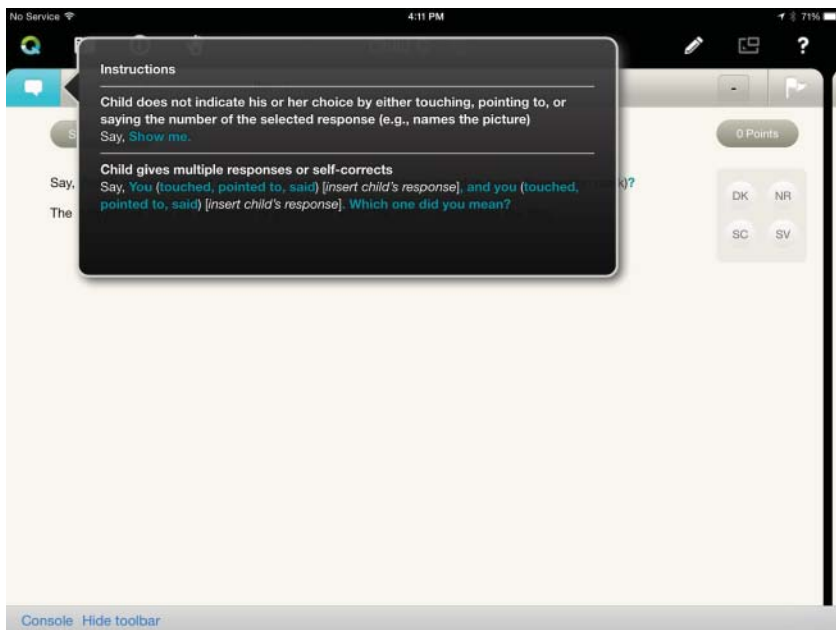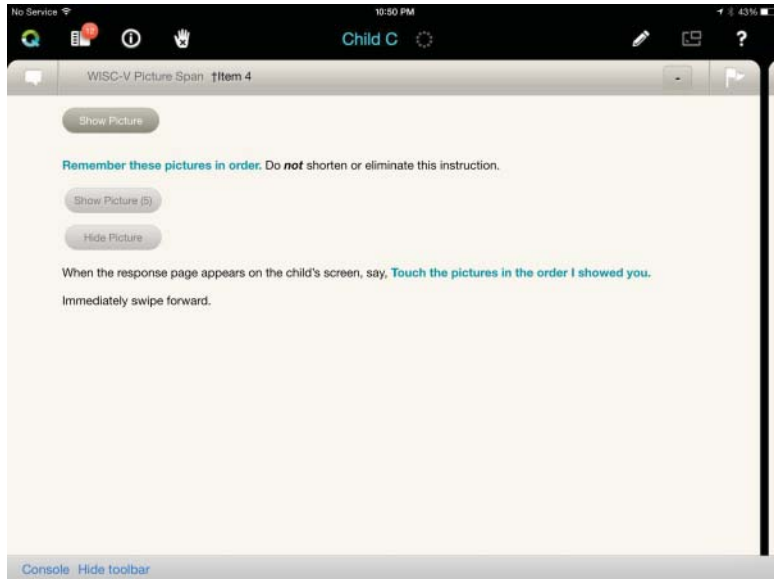

Figure 4.10 Instructions Text Popover on Practitioner's Screen *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).

Figure 4.11 Practitioner's Screen View of an Item, Example A   *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).
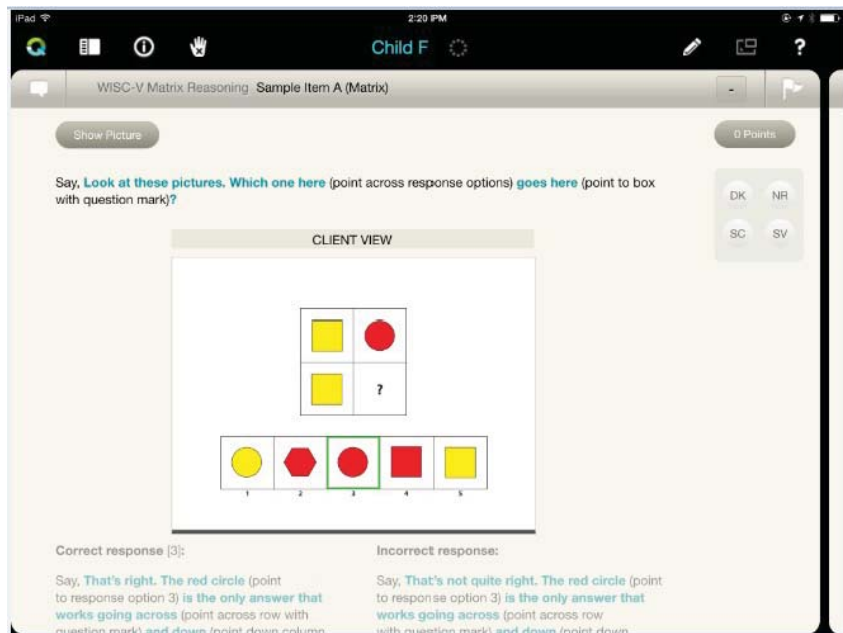

Figure 4.12 Practitioner's Screen View of an Item, Example B   *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).

active link at the time of this writing is: https://qiactive.com/choose-share/support/index.

Basic Scoring Output

When administration of each subtest is completed, an End of Subtest card appears with item-level scores, various other observations that were recorded, and the actual subtest administration time. Touching the Results button on the End of Subtest card produces a Results popover. The Results popover permits immediate access to the subtest scaled score, composite scores, pairwise comparisons, and strengths and weaknesses. Figures 4.13 and 4.14 depict the Results page for subtest scaled and standard scores, in administration order.

Figure 4.15 depicts the Results page for composite scores.

The subtests that were administered are listed in the first column. They currently appear in administration order but can also be ordered by score (high to low or low to high). Touching the triangle-shaped button to the left of a subtest opens a drop-down of additional text that lists the same information from the End of Subtest card.

Advanced Scoring Output

Q-interactive and Q-global (which is described and pictured in Chapter 3) systems are seamlessly connected within Central. Results may be transferred back to Central following administration,
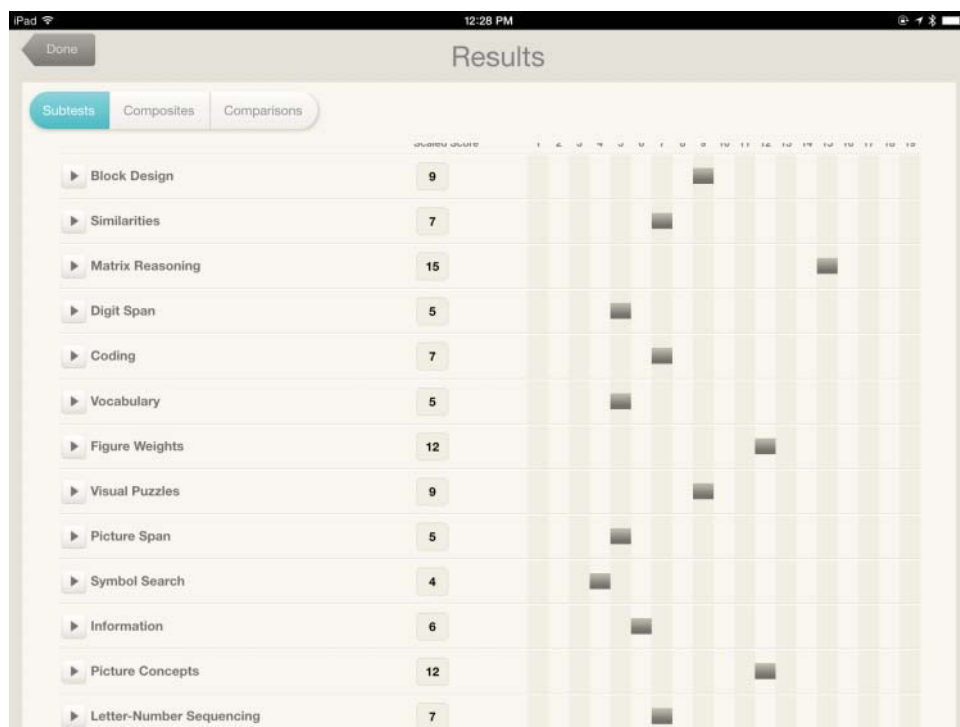

Figure 4.13   Primary and Secondary Subtest Results   *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).
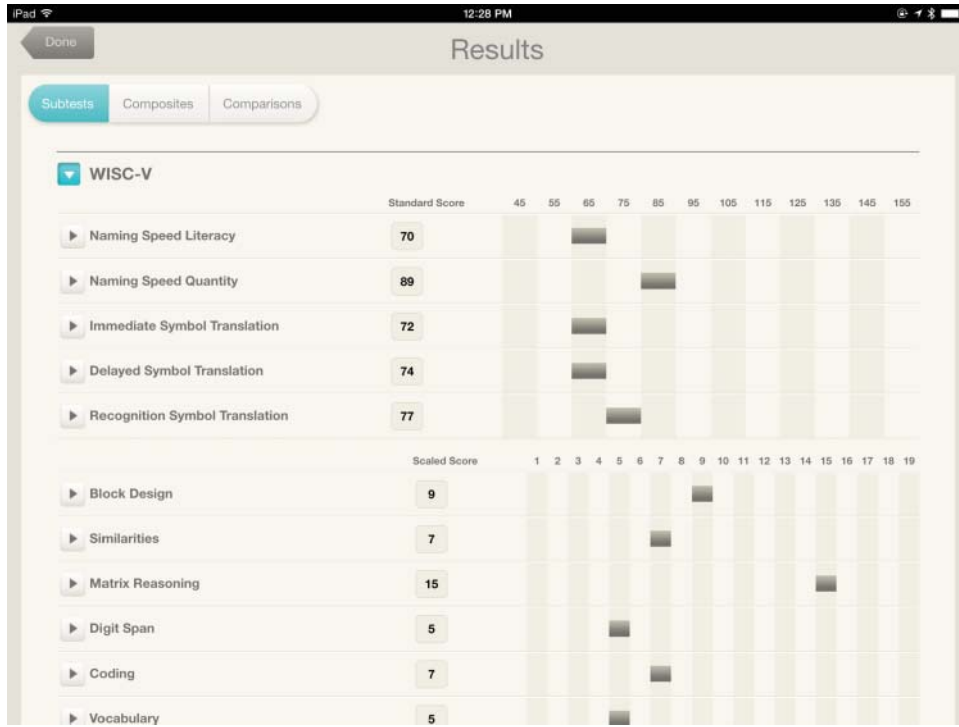
Figure 4.14   Complementary Subtest Results   *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).

where the same interface and selections pictured for Q-global in Chapter 3 are available.

Access to Manuals in Central

As previously noted, the *WISC–V Administration and Scoring Manual*, the *WISC–V Administration and Scoring Manual Supplement*, and the *WISC–V Technical and Interpretive Manual* are all available in digital format on Central. To locate the manuals from the Support tab, select the active link labeled *Test Materials*. Scroll down to the bottom of the webpage because the manuals appear in alphabetical order. See Figure 4.16 for appearance of the links to the manuals.

Potential Clinical Applications and Digital Enhancements

Q-interactive represents a substantial advancement in the clinical assessment field. The adaptation of the WISC–V subtests in a digital environment using tablet devices to replace the stimulus books and Record Form is a welcome change. It is clear that paper response booklets and other manipulatives may also soon be a thing of the past, particularly with the ongoing work to adapt the Processing Speed subtests. Even the Block Design blocks may be subject to digital adaptation. Physical cubes that permit tactile play within an interactive game system and can therefore detect and record movement
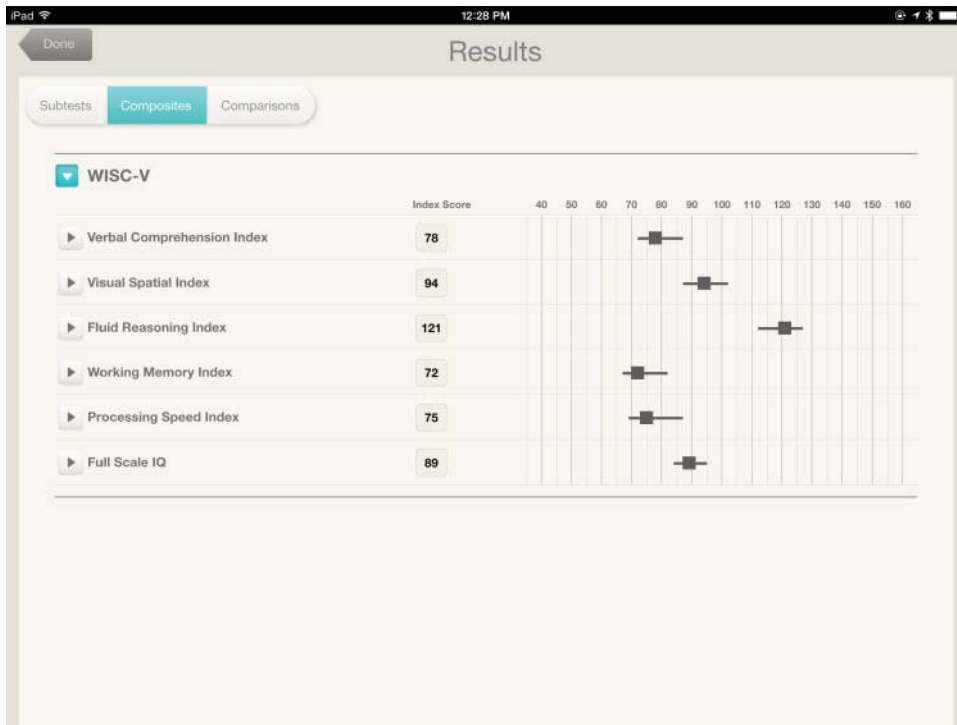
Figure 4.15 Composite Results *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).
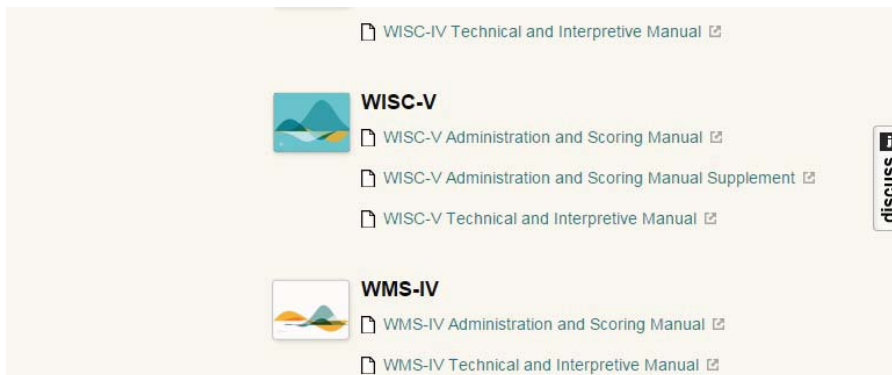

Figure 4.16 Manual Links in Central *Wechsler Intelligence Scale for Children, Fifth Edition* (WISC–V). Copyright © 2014 NCS Pearson, Inc. Reproduced with permission. All rights reserved. "*Wechsler Intelligence Scale for Children*" and "*WISC*" are trademarks, in the United States and/or other countries, of Pearson Education, Inc. or its affiliates(s).

and orientation (e.g., Sifteo Cubes^{TM} by Sifteo, Inc.) are available at this time.

The potential for data, both at the individual level and the group level, is limited only by the imagination. New subtests built purely within the digital realm could make measurement of a number of constructs more feasible. As an example, no currently available battery provides psychometrically rigorous reaction time measures linked with other measures of ability, despite the fact that various types of reaction time have shown sensitivity to dyscalculia (Ashkenazi, Mark-Zigdon, & Henik, 2009),

ADHD (Kuntsi ... Asherson, 2010; Lipszyc & Schachar, 2010; Van De Voorde, Roeyers, Verte, & Wiersema, 2010), specific learning disorder in reading (Lipszyc & Schachar, 2010; Van De Voorde et al., 2010), and bipolar disorder (Mattis, Papolos, Luck, Cockerham, & Thode, 2011), to name a few. Increasingly user-friendly visual-spatial working memory and inhibition control measures are also within sight. Scores for latency time, response time, and complex processing speed are also much more feasible given the flexibility and enhanced data capture potential of the digital medium.