SASC Update November 2022
The Symbol Digit Modalities Test (SDMT)

SASC and its Test Evaluation Committee (STEC) have taken the decision, after careful consideration, to remove this test from the list of approved tests for carrying out a diagnostic assessment. From 30th April 2023, it may still be used qualitatively but test scores should not be reported.

What has led to this decision?

The SDMT (age-range: children 8-17, adults 18-78) is a timed test of coding/processing speed that requires the examinee to substitute a number, either orally or in writing, for randomised presentations of geometric figures.

The SDMT was first published in **1973** by Western Psychological Services and was standardised in the US. The normative data is therefore nearly fifty years old and there has been no subsequent re-standardisation of the test.

In 2016 STEC carried out an extensive review of this test, examining its standardisation data and scoring protocols, alongside recent research related to the test and its efficacy. Detailed guidance for the use of the SDMT was subsequently published on the SASC website and has been available from Downloads as Updated Guidance Symbol Digit Modalities Test. www.sasc.org.uk

At this point, despite many concerns about the age and weak standardisation of this test, it was decided to retain the test on the list of SASC approved tests because it represented the only test of coding that specialist assessors had access to. Psychologists have access to coding tests in large test batteries such as the WISC-V UK[1] and the WAIS-IV UK[2].

When COVID 19 prompted new guidance[3] for administering diagnostic assessment remotely, SASC advised that it would be reasonable, given that the SDMT is available only in oral form for remote administration[4], to omit this test (used remotely ***or*** face to face).

Over the past year, SASC has received more queries related to the scoring and administration of this test than any other single test. There have been questions about:

1. The instructions for administering and scoring the SDMT when administering the written and then the oral test.
2. Whether scores achieved on the SDMT should be reported as a range or whether it is valid to use external methods to calculate a single score.

[1] **WISC-V UK** (Wechsler Intelligence Scale for Children: Fifth UK Edition) Pearson

[2] **WAIS-IV^{UK}** (Wechsler Adult Intelligence Scale Fourth UK Edition) Pearson

[3] Remote Assessment in the Identification of Specific Learning Difficulties March 2021 (updated April 2021) See Downloads www.sasc.org.uk

[4] Only the oral version of the test can be used if administered remotely. A license for remote assessment must be purchased by emailing the publisher and there are extensive restrictions and terms to be observed. There can be issues with font size display and control of scrolling which could affect test administration. Email rights@wpspublish.com

In relation to the first question, SASC has concluded that unclear and confusing advice has been given in the manuals and to assessors when they have made direct enquiries to the test publisher. Errors in the 7th, 8th and 9th printings of the test and revisions in the 10th printing which altered the administration instructions, have led to inconsistencies which threaten the reliability and validity of the test. These inconsistencies highlight the weak original standardisation of the test.

Regarding the second question, the 2016 SASC Updated Guidance on the SDMT made the following recommendation regarding the reporting of scores for examinees: **'***STEC (the SpLD Test Evaluation Committee) recommends reporting scores as presented in the manual, i.e. as distances, in standard deviations, from the mean, for the relevant age group / level of education, or as standardised score range equivalents. For example, a raw score falling between 1.0 SD and 1.5 SD below the mean could be reported as a standardised score of 85-78.'*

The advice to report the range of scores was given NOT because this range represents a confidence interval (it does not) but because the standardisation of the test is too weak for precise standard score calculations to represent sufficiently accurate measures. However, to facilitate comparison of test scores, it seems that many assessors have been artificially imposing a single standard score outcome through the use of external calculation methods. This is unhelpful because it suggests a level of certainty and accuracy regarding the test outcome which cannot be justified from the standardisation of the test.

SASC and STEC have therefore **concluded** that:

- **The SDMT is too old, too weakly standardised, and its administrative instructions too inconsistent to represent a reliable and valid test of coding/processing speed useful to assessors in 2022 and beyond.**
- **There are now more tests available to specialist assessors that capture aspects of processing speed. SASC recommends that assessors explore the potential of these tests as alternatives to the use of the SDMT.**
- **If assessors wish to retain the use of this test as a qualitative tool (for example to explore issues noted elsewhere in the assessment with particularly slow or inaccurate handwriting) this is acceptable as long as the assessment report contains an explanation as to why the test is being used in this restricted way. Scores should not be reported.**

What other tests could I use?

There is a huge amount of variation in the content and style of tests that could potentially investigate aspects of processing speed. Greater attention to what each test purports to measure allows assessors to choose tests that examine issues of particular concern.

Tests that capture underlying processing issues **as manifested in specific skills**, e.g. in reading and writing fluency (speed, accuracy and comprehension) are particularly useful, since they may provide evidence of the ***impact*** of an underlying processing difficulty (though they should not be used to measure the underlying processing difficulty). There are many such reading and writing tests on the SASC Test Lists and most assessors use these routinely.

Timed tests of cognitive processing speed, lexical access/semantic fluency, rapid automised naming, visual-motor speed/visual-motor search/visual perception and of word/non-word reading fluency can highlight certain types of processing issues. In the table below we summarise a range of suitable tests from the SASC Pre and Post 16 Test Lists. They are broadly grouped by type but some tests may 'fit' more than one category. Assessors will also find it helpful to consult the SASC Pre and Post 16 Test Lists, as well as the SASC guidance for remote assessment, which contains a comprehensive test list with information about suitability for remote assessment. See Downloads www.sasc.org.uk

As with all tests, when using any of the tests listed below, assessors should carefully consider the potential impact of any of the following factors before concluding that there is an underlying specific deficit in some aspect of processing speed:

- Visual or auditory impairments
- Slow, hesitant or inaccurate speech articulation
- Problems with fine motor coordination and/or hand-eye coordination
- Restricted language knowledge due to low ability, EAL or other environmental circumstances
- Underdeveloped reading skills due to differences/gaps in educational experience
- Underdeveloped reading skills due to insufficient practice
- Effect of inattention/demotivation on performance

As a general rule, the more content heavy a test is, i.e. the more it relies on prior knowledge of letters, numbers, spellings, words etc., the greater the risk that what is being measured is prior knowledge rather than processing speed. When selecting tests of processing speed and interpreting test results, assessors need, therefore, to take into account the level of prior knowledge required by the test.

Tests of cognitive processing speed i.e. those that may capture elements of processing speed, (visual and/or verbal), working memory, executive processing, attention and concentration and manual dexterity.	**Woodcock Johnson IV Tests of Cognitive Abilities WJIV COG. US Norms. Riverside Insights. 2-90+ yrs.** • **Letter Pattern Matching -** Examinee locates and draws a line through two identical letter patterns in rows of six letter patterns. 3 minute time limit. Measures speed at which can make visual symbol discriminations and identify common orthographic (spelling) patterns. • **Pair Cancellation** - Examinee is asked to locate and circle a repeated pattern of objects as quickly as possible. 3 minute time limit. Provides information about interference and inhibition control (executive processing**),** sustained attention (**attention/concentration**), ability to perform a simple cognitive task under time pressure (processing speed) • **Number Pattern Matching** - Examinee locates and draws a line through two identical numbers in a row of 6 numbers – difficulty increases from single-digit numbers to triple-digit numbers. 3 minute time limit. Measures the speed at which an examinee can make visual symbol discriminations.

	Feifer Assessment of Reading FAR Fluency Index. US Norms. PAR. 4:0-21:11 yrs. • **Orthographical Processing** (OP) – Recall letter(s) in target words/nonwords [8 mins]
Tests of speed of lexical access/semantic fluency i.e. those that tap into vocabulary knowledge, phonological skills, long-term memory and verbal fluency. NB. Tests of phonological access (where the candidate is asked to name words beginning with a certain letter) may tap into different cognitive processes and have different potential impacts upon reading and spoken expression than tests of semantic access (where the candidate is asked to name words in a particular category).	**Woodcock Johnson IV Tests of Oral Language WJIV OL. US Norms. Riverside Insights. 2-90+ yrs.** • **WJIV OL Retrieval Fluency** - examinee names as many words as possible from a given category (three items, each timed for 1 minute) **Test of Information Processing Skills TIPS (Verbal Fluency). US Norms Academic Therapy publications. 5:0-90+ yrs (but the Word Fluency tests are for age 9 and older)** • **Word lists** are generated orally within one-minute spans (two items, each beginning with a different letter) • **Word lists** are written within one-minute spans (two items, each beginning with a different letter) **Phonological Assessment Battery PhAB2 Primary. GL Assessment 5.0 – 11yrs** • **Fluency Test** (5–11 years) assess a child's ability to retrieve phonological information from long-term memory. (3 parts to test, each 30 seconds). **Feifer Assessment of Reading FAR Fluency Index. US Norms. PAR. 4:0-21:11 yrs** • **Verbal Fluency** (VF) – Generated words by Category and by Letter Onset (2 mins)
Tests of Rapid Automised Naming (RAN)	**Comprehensive Test of Phonological Processing 2nd Edition CTOPP2. US Norms. PRO-ED Inc.** • **Rapid Digit Naming** 4-24 years (RD) measures the speed at which an individual can name numbers. • **Rapid Letter Naming** 4-24 years (RL) measures the speed at which an individual can name letters. • **Rapid Colour Naming** 4-6 years (RC) measures the speed at which an individual can name the colours of a series of different coloured blocks. • **Rapid Object Naming** 4-6 years (RO) measures the speed with which an individual can name a series of objects. **Feifer Assessment of Reading FAR Fluency Index. US Norms. PAR. 4:0-21:11 yrs**

	• **Rapid Automatic Naming** (RAN) – Younger: Object/Letter Naming; Older: Object/Stencilled Letter Naming [2 mins] **Rapid Automatized Naming and Rapid Alternating Stimulus Test RAN/RAS US Norms PRO-ED, Inc 5:0-18:11 yrs** **Phonological Assessment Battery PHAB2 Primary GL Assessment 5.0 – 11yrs** • **Naming Speed Tests** – testing speed of phonological production, including Picture Naming Test and Digit Naming Test **Woodcock Johnson IV Tests of Oral Language WJIV OL. US Norms. Riverside Insights. 2-90+ yrs.** . • **Rapid Picture Naming** : Student names as many pictures of objects as possible within a 2 minute time limit. Measures rapid naming facility and speed of lexical access. NB: There is no Rapid Naming test in the **WJIV Cog**
Tests of visual-motor speed/ visual-motor search/visual perception	**Developmental Test of Visual Perception-adolescent and adult DTPV-A:2 US Norms PRO-ED, Inc. 11:0-74:11yrs (the subtests below are not included in the DTVP3)** • **Visual-motor search** (connecting circles with a line in numerical sequences, as quickly as possible) • **Visual-motor speed** (complete the designs from a stimulus picture as fast as they can) **Feifer Assessment of Reading FAR Fluency Index. US Norms. PAR. 4:0-21:11 yrs** • **Visual Perception** (VP) – Identify words containing reversed letters in 30 seconds (1min)
Tests of word/non-word reading fluency. NB. These tests can be used to explore the impact of slow processing identified in cognitive tests.	**Feifer Assessment of Reading FAR Fluency Index. US Norms. PAR. 4:0-21:11 yrs** • **Irregular Word Reading Fluency** (IRR) – Read phonologically irregular words in 60 seconds [1 min] **Test of Word Reading Efficiency 2nd Edition TOWRE-2 US Norms PRO-ED, Inc. 6:0-24:11 yrs.** • **Sight word efficiency** • **Phonemic decoding efficiency** Tests measure an individual's ability to pronounce printed words and phonemically regular non-words accurately and fluently