Development of a Cantonese version of the Birmingham Cognitive Screen (BCoS) for stroke survivors in Hong Kong

Chan Yung, John

A dissertation submitted in partial fulfilment of the requirements for the Bachelor of Science (Speech and Hearing Sciences), The University of Hong Kong, June 30, 2013.

Abstract

The Birmingham Cognitive Screen (BCoS) is a validated neuropsychological assessment tool developed to assess different cognitive domains including language disorders in patients who have brain injuries. The aim of the present study was to develop a valid Cantonese version of the BCoS so as to evaluate the ability of the BCoS to differentiate between stroke survivors and healthy individuals. Twenty two stroke participants and sixteen matched controls were recruited. The participants were administered the HK-BCoS as well as measures of cognitive and language function validated for the Cantonese-speaking population including the CAB, the C-MMSE and the HK-MoCA whereas the control participants were administered the HK-BCoS only. Results showed that the HK-BCoS has good concurrent validity with the CAB, the C-MMSE and the HK-MoCA. It can discriminate between stroke patients with cognitive impairments and healthy controls. Furthermore, the HK-BCoS was found to have excellent intra-rater and inter-rater reliability, good test-retest reliability and fair split-half reliability. In sum, the HK-BCoS is a valid and reliable assessment tool for assessing cognitive impairments in Cantonese-speaking stroke survivors in Hong Kong. The implications for clinical use in aphasia are described.

Development of a Cantonese version of the Birmingham Cognitive Screen (BCoS) for stroke survivors in Hong Kong

Stroke is a neurological disorder secondary to vascular disease (Mlcoch & Metter, 2008) that may lead to cognitive impairments in a variety of cognitive domains including memory, attention, executive functions, visuoperceptual and visuospatial skills (Lincoln, Kneebone, Macniven, & Morris, 2011). It is also the most common cause of aphasia in several different languages (Hallowell & Chapey, 2008). Cognitive and language impairments can affect rehabilitation outcome and recovery in stroke survivors and aphasia can be a barrier to the access of health care services (Hommel, Miguel, Naegele, Gonnet, & Jaillard, 2009; Leśniak, Bak, Czepiel, Seniów, & Członkowska, 2008). Therefore, a valid, reliable, comprehensive and informative assessment of acquired impairment in different cognitive and language domains is essential to planning specific and effective rehabilitation program for stroke survivors.

Many different cognitive screening measures are available for assessing stroke patients. However, most of these are designed to detect cognitive impairment in dementia (Lincoln et al., 2011). These tests include the Mini-Mental State Examination (MMSE; Folstein, Folstein, & McHugh, 1975), the Montreal Cognitive Assessment (MoCA; Nasreddine et al., 2005) and the Addenbrooke's Cognitive Examination Revised (ACE-R; Mioshi, Dawson, Mitchell, Arnold, & Hodges, 2006). Many of these tests have been modified for Chinese speaking patients and most have been shown to be reliable and valid measures for use in the Cantonese speaking population.

The MMSE is a cognitive screening test comprising eleven items for assessing self-orientation, registration, attention and calculation, recall and language. The maximum score for the test is 30 and the cut-off score for cognitive impairment is 20 (Folstein et al., 1975.) Similarly, the MoCA is a cognitive screening comprising eight sections for assessing

visuospatial ability, naming, attention, immediate recall, language, conceptual thinking, delayed recall and orientation. The maximum score for the test is 30 with one point added for a patient who has received only 12 years of formal education or less. The cut-off score for the classification of cognitive impairment is 26 (Nasreddine et al., 2005). The ACE-R is another valid cognitive screening test with five subscales examining attention and orientation, memory, fluency, language and visuospatial skills. The maximum score of the ACE-R is 100 and two cut-off scores (82 and 88) have been identified. At the cut-off score of 88, the ACE-R shows a high sensitivity (94%) and a high specificity (89%). At the cut-off score of 82, the ACE-R shows a reduced sensitivity (84%) but increased specificity (100%) (Mioshi et al., 2006). In general, the MMSE, the MoCA and the ACE-R are all cognitive screening tests that are primarily designed for assessment of cognitive impairment in dementia patients with potential application to other clinical settings (aphasia and stroke).

Although the MMSE, the MoCA and the ACE-R have not been validated as a screening test for post-stroke cognitive deficits, Pendlebury, Cuthbertson, Welch, Mehta, and Rothwell (2010) have recently employed the MMSE and the MoCA to compare their sensitivity to the cognitive deficits in patients with either 6-month post-onset or 5-year post-onset transient ischemic attack and stroke. The results showed that the MoCA was a better indicator to detect cognitive deficits, though the values of sensitivity and specificity of the MMSE and the MoCA were not determined in the study.

Recently, other stroke-specific screening tests have been developed such as the Comprehensive Cognitive Neurological Test in Stroke (Coconuts; Hoffmann, Schmitt, & Bromley, 2009). There are 60 items in the test to assess five cognitive domains, including executive functions, language, spatial skills, visual processing and memory. Compared to the MMSE and the MoCA, the Coconuts includes items for assessing motor speech, emotions, serial motor programming and complex visual processing. It also includes items for

detecting the presence of neglect, anosognosia, disconnection syndromes, delusional misidentification syndrome, amusia, allesthesia, sutoscopy and synesthesia, which are not assessed by the MMSE and the MoCA but can be present in patients after stroke (Hoffmann et al., 2009). However, although the test has a high sensitivity (91%), it had a low specificity (35%) when tested with 1796 patients within the first month of stroke, indicating that the test could not exclude many cognitively normal people. Hoffmann et al. (2009) suggested that the test is more comprehensive than other current cognitive screening tests for assessing the cognitive deficits in patients with stroke, although they acknowledged that the test was rudimentary. Moreover, unlike the MMSE, the MoCA and the ACE-R, the Coconuts was designed to be used mainly by psychologists and occupational therapists (Lincoln et al., 2011). Overall, several neuropsychological screening tests are available for assessing cognitive impairments in English-speaking patients after stroke, but their validity in post-stroke cognitive impairment will need to be further studied. Some of these tests have been translated into other languages. However, the reliability and validity of translated tests also needs to be established particularly when using these tests for aphasia.

For the Cantonese-speaking population in Hong Kong, very few published tests are available to assess a specific cognitive domain or a variety of cognitive functions. Many of these tests were adapted and translated from English. For example, the Cantonese Aphasia Battery (CAB; Yiu, 1992) is a standardized diagnostic test developed for assessing the type and severity of aphasia in Cantonese-speaking stroke survivors. It was adapted and translated from the Western Aphasia Battery (WAB; Kertesz, 1982) and Boston Diagnostic Aphasia Examination (BDAE; Goodglass & Kaplan, 1983). It was standardized by administration to 54 aphasic patients and 24 normal controls (Yiu, 1992). It comprises sub-tests measuring spontaneous speech (fluency and information), auditory comprehension, repetition, naming and optional tests assessing reading, writing, praxis, drawing and visual

attention. For the differential diagnosis of aphasia, only subtest scores (measured as sub aphasia quotients) in speech fluency, auditory comprehension, repetition and naming are selected for comparison to the diagnostic criteria. The total aphasia quotient (AQ) can be calculated to assess the severity of aphasia. The lower AQ indicates greater severity of aphasia. The CAB is commonly used by speech therapists in clinical settings in Hong Kong for the diagnosis of aphasia. As an assessment tool, it has high validity, test-retest reliability, inter-rater reliability as well as intra-rater reliability. However, the CAB is specifically used for assessing language impairment and does not extend to assessing other cognitive domains.

For the screening of cognitive impairments in Cantonese-speaking population in Hong Kong, some neuropsychological assessment tools are available, including the Cantonese version of the Mini-Mental State Examination (C-MMSE; Chiu, Lee, Chung, & Kwong, 1994) and the Hong Kong Montreal Cognitive Assessment (HK-MoCA; Wong et al., 2009). The C-MMSE (Chiu et al., 1994) is a 10-minute screening tool for assessing cognitive domains including orientation, attention, calculation, memory and language for Cantonese-speaking patients. It was translated from the English version of the MMSE (Folstein et al., 1975) by a team of psychiatrists and validated by comparison with the scores obtained from 79 subjects who had moderate to severe dementia and 111 normal elderly controls (Chiu et al., 1994). It contains 11 items and the maximum total score is 30. Different cut-off scores are suggested for further evaluation of cognitive impairment, according to different education levels. A cut-off score of 25 is suggested for patients who are at secondary school level or even tertiary school level. A cuf-off score of 21 is suggested for patients with primary school level while a cut-off score of 18 is suggested for patients who are not educated. It shows reasonable validity, test-retest reliability and inter-rater reliability for the assessment of cognitive impairments in Cantonese speakers in Hong Kong (Chiu et al., 1994). However, the test was validated on patients with moderate to severe dementia and therefore the validity for

assessing cognitive impairments after stroke is not yet determined. Similarly, the HK-MoCA is a 10-minute screening tool designed to detect cognitive impairment for Cantonese-speaking patients in different domains, including orientation, attention, memory, language, visuo-constructional skills, conceptual thinking and executive functions. The test was translated from English and validated on 40 subjects with cerebral vessel small disease plus a history of ischaemic stroke and 40 controls (Wong et al., 2009). The test contains eight sections in total and the maximum score is 30. One point is added for a patient with six years or fewer of formal education and the cut-off score for cognitive impairment is 22. The HK-MoCA demonstrated good validity, test-retest reliability, inter-rater reliability as well as clinical utility (Wong et al., 2009).

Although both the C-MMSE and the HK-MoCA have good validity and reliability for the initial screening of cognitive functions, these tools include few trials for testing different cognitive domains. The total scores obtained from these tests can provide the clinician with information about a patient's general cognitive ability, but neither the total score nor the sub-scores of each section can inform the clinician about which cognitive domain(s) requires a more in-depth neuropsychological testing, leading to lack of clinical utility when making recommendations about a specific and effective rehabilitation plan for patients. Moreover, most tasks in the HK-MoCA and the C-MMSE require intact auditory comprehension of instructions and questions as well as a verbal response. Therefore, the cognitive abilities of a patient may be severely underestimated if aphasia is present in the patient profile. Potential for misdiagnosis can have implications for choice of rehabilitation and treatment planning.

To provide a more comprehensive guide for the assessment of cognitive impairments, the Birmingham Cognitive Screen (BCoS; Humphreys, Bickerton, Samson, & Riddoch, 2012) was developed. The BCoS is a test comprising 23 sections and there are multiple items in

each section. The sections include: 1a) Orientation – Personal Information; 1b) Orientation – Time and Space; 1c) Orientation – Nosognosia; 2) Picture Naming; 3) Sentence Construction; 4) Sentence Reading; 5) Nonword Reading; 6) Story Recall and Recognition – Immediate Recall; 7) Apple Cancellation; 8) Visual Extinction; 9) Tactile Extinction; 10) Rule Finding and Concept Switching Test; 11) Auditory Attention; 12) Story Recall and Recognition – Delayed Recall; 13) Multi-Step Object Use; 14) Gesture Production; 15) Gesture Recognition; 16) Meaningless Gesture Imitation; 17) Task Recall; 18) Word/Nonword Writing; 19) Number/Price/Time Reading; 20) Number Writing; 21) Calculation; 22) Complex Figure Copy; and 23) Instruction Comprehension. Each section is designed to assess a variety of cognitive domains such as short term memory, long term memory, language, spatial attention, controlled attention, action planning and control, and number processing. There are also tests of apraxia for providing a valid way to detect disorders of planned movement (Bickerton et al., 2012). For each section, a total score can be calculated. However, unlike the CAB, the C-MMSE and the HK-MoCA, a total score for the whole BCoS is not applicable, since the aim of the BCoS is to provide a guide for in-depth investigations into each cognitive domain instead of assessing the overall cognitive deficits. The BCoS typically takes between 45 to 75 minutes for a complete assessment. One major advantage of the BCoS is that it can be used by a wide range of health professionals who can use the BCoS as part of their assessments.

Compared to the CAB, the BCoS is designed to assess a variety of cognitive domains in patients who have brain injuries, and is not limited to aphasia only (Humphreys et al., 2012). Unlike the C-MMSE and the HK-MoCA, the BCoS can be used for a comprehensive screening of cognitive domains, since it includes more items testing each domain. The BCoS can also be used to detect the presence of spatial neglect and apraxia, which is not assessed by the C-MMSE or the HK-MoCA. Moreover, to improve the

cognitive assessment of patients who have aphasia, dysarthria or apraxia of speech, a variety of testing modalities can be administered simultaneously allowing responses to be communicated through non-verbal means. For instance, written questions and multiple choices are presented simultaneously with verbal input to patients during the tasks of orientation, story recall, auditory attention, gesture production, gesture recognition and task recall, so that cognitive ability in the domains of orientation, memory, action planning and control, and attention will be not underestimated due to poor verbal production or poor auditory comprehension. Patients can choose to write down the answer for the task of orientation to personal information so that their cognitive ability can be assessed regardless of the integrity of their verbal output. Visual stimuli, such as pictures, are also provided in the task of multiple object manipulation so as to facilitate the patients' understanding of the tasks. Such visual and written cues are not present in the CAB, the C-MMSE or the HK-MoCA, as the instructions and questions for those tests are presented verbally to the patients. Furthermore, practice trials and demonstration are included in the tasks of sentence construction, cancellation, rule finding and concept switching test, auditory attention, gesture production, and gesture recognition in the BCoS, to facilitate the patients' understanding of the task instructions. Practice trials are not included in the CAB, the C-MMSE or the HK-MoCA.

Culturally specific items and normative data are essential for the BCoS to be reliable and valid for the Cantonese-speaking population in Hong Kong. Nevertheless, the Cantonese version of the BCoS has not yet been validated in the Hong Kong population. Therefore, the first aim of the current study is to develop a Cantonese version of the BCoS by translation with cultural modification from the English version. The second aim is to validate the Cantonese version of the BCoS by comparing scores of a group of stroke patients on the Cantonese version of the BCoS with their scores in the CAB, the C-MMSE and the

HK-MoCA. The third aim is to evaluate the ability of the Cantonese version of the BCoS to differentiate between stroke survivors and healthy individuals who are matched in age, education and gender.

Method

Translation and modification of the BCoS

The English version of the BCoS was translated by AK and JL, members of the BCoS development team, into a Cantonese version which was named the Hong Kong Birmingham Cognitive Screen (HK-BCoS). The examiner's booklet of the HK-BCoS was included in Appendix A. Most items were directly adopted and translated from the English version, with some cultural and linguistic modifications as listed in Appendix B.

Participants

Twenty two participants with stroke (14 male and eight female) were recruited. Twenty of them were recruited from Centers at the Community Rehabilitation Network in Hong Kong while two of them were recruited through personal invitation. The participants were selected if they had a post-onset time of at least six months on the first assessment day and were native speakers of Cantonese. The background of the participants is summarized in Table 1.

Sixteen controls were recruited through personal invitation. They were selected if they had no history of stroke and were native speakers of Cantonese, matched with each stroke participant in gender, age (five years older or younger), and in the education range (Not educated; Primary school level; Junior secondary school level; Senior secondary school level; Tertiary education level).

Table 1

The Background Information of the Participants with Stroke

Subject	Gender	Age	Education	Number of	Side of affected	Type of Aphasia (if	Aphasia Quotient	Post-onset (Month)

				stroke	hemisphere	any)		
HKP01	M	41	Junior	1	L	Anomia	85	11
HKP02	M	48	Senior	1	R	N/A	93.9	12
HKP03	M	46	Junior	1	L	N/A	99	32
HKP04	F	68	Primary	1	L	Anomia	92.1	6
HKP05	F	60	Senior	1	L	Broca's	56.5	22
HKP06	F	50	Senior	1	L	Anomia	86.5	141
HKP07	M	43	Senior	1	L	Anomia	84.8	49
HKP08	M	50	Tertiary	1	L	Transcortical Motor	56.6	12
HKP09	F	73	Junior	2	L & R	Broca's	41.1	11 & 2
HKP10	M	61	Senior	1	R	N/A	98.3	89
HKP11	M	54	Tertiary	1	R	Anomia	85.6	27
HKP12	F	62	Junior	1	L	N/A	99.2	50
HKP13	M	47	Junior	1	L	Transcortical Motor	62.8	38
HKP14	M	40	Senior	1	L	Broca's	34.8	59
HKP15	M	46	Tertiary	1	L	N/A	98.2	111
HKP16	F	68	Senior	1	R	N/A	98.4	24
HKP17	M	50	Senior	1	L	Broca's	50.2	46
HKP18	M	58	Junior	1	L	N/A	96.1	40
HKP19	F	68	Tertiary	1	R	N/A	97.6	27
HKP20	M	55	Junior	1	L	Transcortical Sensory	66.6	22
HKP21	F	78	No	1	L	Transcortical Sensory	68.6	10
HKP22	M	62	Primary	1	R	N/A	99.8	45

Note. F = Female, M = Male; No = Not Educated, Primary = Primary School Level, Junior = Junior Secondary School Level, Senior = Senior Secondary School Level, Tertiary = Tertiary Education Level; L = Left, R = Right; N/A = Not Applicable.

Assessment Procedures

Each participant in the stroke group was administered the HK-BCoS, the CAB, the C-MMSE and the HK-MoCA. The whole testing was divided into three or fewer sessions, depending on the response time as well as the fatigue level of the participants. The length of each testing session was between one hour and three hours. The performance of four participants was videotaped with prior consent obtained, for the establishment of inter-rater and intra-rater reliability of the HK-BCoS. Five partcipants were invited to complete the HK-BCoS for the second time within five months of the first HK-BCoS assessment session, in order to study the test-retest reliability of the HK-BCoS. For the control group, only the HK-BCoS was administered and all the controls were able to complete the test in one day.

Data and statistical analysis

To establish the concurrent validity of the HK-BCoS, the scores obtained from the sections of 1b) Orientation – Time and Space; 2) Picture naming; 3) Sentence construction; 4) Sentence reading; 5) Nonword Reading; 6) Story Recall and Recognition – Immediate recall; 11) Auditory Attention; 12) Story Recall and Recognition – Delayed recall; 18) Number/Price/Time Reading; 19) Number Writing; 21) Word Writing; 22) Complex Figure Copy; and 23) Instruction Comprehension were compared against the scores obtained from the tasks assessing the same area in the CAB, the C-MMSE and the HK-MoCA, using Pearson correlation, in order to determine whether the scores on the same area are correlated in the four different assessment tools.

In order to establish the inter-rater and intra-rater reliability of the HK-BCoS, the videos of the four stroke participants were reviewed and then scored by the author JC and the HK-BCoS developer JL. To obtain inter-rater reliability, the score in each section by JC was compared with the corresponding score by JL, using Pearson correlation. To obtain intra-rater reliability, the scores by JC after video review was compared with the scores by JC before the video review, using Pearson correlation.

Test-retest reliability of the HK-BCoS was measured to determine if the results from the HK-BCoS are replicable over time. Five participants were invited to complete the HK-BCoS for the second time within five months (T2) of the first HK-BCoS assessment session (T1), administered by the author JC. The scores obtained in the retest session (T2) were compared with the original scores (T1), using Pearson correlation.

The split-half reliability of the HK-BCoS was also examined. The items of each section were divided into two halves –odd-numbered items and even-numbered items. Total scores from odd-numbered items were then compared with the total scores from the even-numbered items, using Pearson correlation, in order to determine whether the two

halves are measuring the same constructs.

To investigate the capability of the HK-BCoS to differentiate between stroke survivors and unimpaired people matched for gender, age and education, the scores obtained from the stroke group were compared with the scores in the control group, using paired-sample *t*-tests, in order to determine whether the scores in the two groups were significantly different.

Results

The performance of the stroke group and control group on different components of the HK-BCoS is displayed in Table 2. The performance of the control group was generally better than the performance of stroke group in all sections of the HK-BCoS, except that both groups obtained near perfect scores on the left unilateral score in the task of visual extinction. The standard deviations and range of scores in stroke group were greater than those in control group for all sections, indicating a wider range of individual variations within the stroke group. For the sections of orientation to time and space, tactile extinction and multi-step object use, all participants in control group were able to obtain full scores while it was not the case for stroke group.

Table 2

Descriptive Statistics of the Scores in the Stroke Group and Control Group

Section	**Score**	**Stroke group**			**Control group**		
		Mean	**SD**	**Range**	**Mean**	**SD**	**Range**
1a) Orientation – Personal Information	Total score	7.36	1.14	4–8	7.94	0.25	7–8
1b) Orientation – Time and Space	Free response score	4.77	1.80	0–6	6.00	0	6
	Free response & Multiple choice score	5.91	0.29	5–6	6.00	0	6
1c) Orientation – Nosognosia	Total score	2.27	0.70	0–3	2.75	0.58	1–3
2) Picture Naming	Total score	14.27	7.03	0–21	20.00	1.79	15–21
3) Sentence Construction	Total score	4.68	3.34	0–8	7.69	1.01	4–8
4) Sentence Reading	Total score	27.23	15.07	0–40	37.06	9.90	0–40
5) Nonword Reading	Total score	3.59	2.67	0–6	5.50	1.55	0–6
6) Story Recall and	Free recall score	4.02	4.04	0–13	6.59	3.31	0–13.5

Recognition – Immediate Recall	Free recall & Recognition score	9.68	4.10	0–15	11.69	3.16	4–15
7) Apple Cancellation	Total score	45.09	11.12	0–50	48.62	1.78	44–50
8) Visual Extinction	Left unilateral score	4.00	0	4	4.00	0	4
	Right unilateral score	3.50	1.23	0–4	4.00	0	4
	Left bilateral score	7.73	1.08	3–8	7.88	0.50	6–8
	Right bilateral score	7.18	2.11	0–8	8.00	0	8
9) Tactile Extinction	Left unilateral score	3.50	1.19	0–4	4.00	0	4
	Right unilateral score	3.59	0.80	1–4	4.00	0	4
	Left bilateral score	7.91	0.43	6–8	8.00	0	8
	Right bilateral score	6.77	2.37	0–8	8.00	0	8
10) Rule Finding and Concept Switching Test	Total score	9.86	5.48	0–16	10.44	5.03	0–16
11) Auditory Attention	Total score	37.64	16.33	0–54	51.31	7.65	23–54
12) Story Recall and Recognition – Delayed Recall	Free recall score	4.73	4.81	0–14.5	9.06	3.74	0–14
	Free recall & Recognition score	11.14	3.45	4–15	13.44	2.37	7–15
13) Multi-Step Object Use	Total score	10.91	2.22	2–12	12.00	0	12
14) Gesture Production	Total score	14.45	4.72	2–20	16.25	2.93	10–20
15) Gesture Recognition	Total score	5.14	0.94	3–6	5.88	0.50	4–6
16) Meaningless Gesture Imitation	Total score	10.95	1.05	9–12	11.81	0.54	10–12
17) Task Recall	Total score	8.23	1.48	4–10	9.63	0.50	9–10
18) Number/ Price/ Time Reading	Total score	5.27	3.56	0–9	8.50	0.97	6–9
19) Number Writing	Total score	3.05	2.08	0–5	4.19	1.64	0–5
20) Calculation	Total score	3.00	1.27	0–4	3.69	0.79	1–4
21) Word Writing	Total score	6.18	4.51	0–13	8.69	3.44	0–12
22) Complex Figure Copy	Total score	39.95	12.69	0–47	44.44	3.29	37–47
23) Instruction Comprehension	Total score	2.64	0.66	1–3	2.94	0.25	2–3

Note. SD = Standard deviation.

Table 3 displays the results of paired-sample *t*-tests comparing the performance on the HK-BCoS between the stroke and control groups. The differences were statistically significant for most sections, except for the scores in the sections of recognition of time and space, apple cancellation, visual extinction, tactile extinction, rule finding and concept switching test, gesture production, and complex figure copy. The differences in scores were the most significant in the sections of sentence construction, auditory attention, delayed story recall and number/price/time reading. To conclude, the control group performed significantly better than the stroke counterparts in the HK-BCoS, particularly in the sections

of sentence construction, auditory attention, delayed story recall and number/price/time reading.

Table 3

Results of Paired-sample t-test Between the Scores of Stroke Group and Control Group

Section	**Score**	**df**	***t*-value**
1a) Orientation – Personal Information	Total score	15	-2.448*
1b) Orientation – Time and Space	Free response score	15	-3.511**
	Free response & Multiple choice score	15	-1.464
1c) Orientation – Nosognosia	Total score	15	-3.478**
2) Picture Naming	Total score	15	-3.819**
3) Sentence Construction	Total score	15	-4.508***
4) Sentence Reading	Total score	15	-2.795*
5) Nonword Reading	Total score	15	-3.667**
6) Story Recall and Recognition – Immediate Recall	Free recall score	15	-3.150**
	Free recall & Recognition score	15	-2.279*
7) Apple Cancellation	Total score	15	-1.156
8) Visual Extinction	Left unilateral score	15	#
	Right unilateral score	15	-1.649
	Left bilateral score	15	1.000
	Right bilateral score	15	-1.861
9) Tactile Extinction	Left unilateral score	15	-2.033
	Right unilateral score	15	-2.076
	Left bilateral score	15	#
	Right bilateral score	15	-2.546*
10) Rule Finding and Concept Switching Test	Total score	15	-0.698
11) Auditory Attention	Total score	15	-4.247***
12) Story Recall and Recognition – Delayed Recall	Free recall score	15	-3.928***
	Free recall & Recognition score	15	-3.505**
13) Multi-Step Object Use	Total score	15	-2.397*
14) Gesture Production	Total score	15	-1.845
15) Gesture Recognition	Total score	15	-3.416**
16) Meaningless Gesture Imitation	Total score	15	-2.416*
17) Task Recall	Total score	15	-3.216**
18) Number/ Price/ Time Reading	Total score	15	-4.311***
19) Number Writing	Total score	15	-2.316*
20) Calculation	Total score	15	-3.597**
21) Word Writing	Total score	15	-2.596*
22) Complex Figure Copy	Total score	15	-1.783
23) Instruction Comprehension	Total score	15	-2.406*

Note. df = degree of freedom; *$p \leq .05$. ** $p \leq .01$. ***$p \leq .001$; # indicates that the standard error of the difference is 0 since all participants in both groups obtained full scores.

Table 4

The Correlations between Scores in the HK-BCoS, the CAB, the C-MMSE, and the HK-MoCA.

		HK-BCoS scores													
		Orient	Naming	Sent Constr	Sent Reading	Nonw Reading	Imme Recall (Free)	Audit Attent	Delayed Recall (Free)	Delayed Recall (Recog)	Number Reading	Number Writing	Word Writing	Complex Figure Copy	Instuct Compre
CAB scores	SS–Information	–	.821***	.910***	–	–	.641***	–	.638***	–	–	–	–	–	–
	SS–Fluency	–	–	.958***	–	–	.631**	–	.636***	–	–	–	–	–	–
	SS–Total	–	–	.962***	–	–	.648***	–	.650***	–	–	–	–	–	–
	Auditory Comprehension	–	–	–	–	–	–	–	–	–	–	–	–	–	.681***
	Naming	–	.939***	–	–	–	–	–	–	–	–	–	–	–	–
	Reading	–	–	–	.780***	.906***	–	–	–	–	.714***	–	–	–	–
	Writing	–	–	–	–	–	–	–	–	–	–	.812***	.772***	–	–
	AQ	–	–	.906***	–	–	.660***	–	.702***	–	–	–	–	–	.743***
	LQ	–	–	.933***	.912***	.954***	.632**	–	.678***	–	.860***	.908***	.702***	–	.730***
C-MMSE scores	Orientation	.882***	–	–	–	–	–	–	–	–	–	–	–	–	–
	Immediate Recall	–	–	–	–	–	.436*	–	–	–	–	–	–	–	–
	Attention	–	–	–	–	–	–	.636***	–	–	–	–	–	–	–
	Delayed Recall	–	–	–	–	–	–	–	.622**	.369	–	–	–	–	–
	Naming	–	.529*	–	–	–	–	–	–	–	–	–	–	–	–
	Language	–	–	.681***	–	–	.495*	–	.534*	–	–	–	–	–	–
	Reading	–	–	–	.615**	.650***	–	–	–	–	.443*	–	–	–	–
	Visual-Spatial	–	–	–	–	–	–	–	–	–	–	–	–	.757***	–
HK-MoCA scores	Visual-Spatial/ Executive	–	–	–	–	–	–	–	–	–	–	–	–	.325	–
	Naming	–	.607**	–	–	–	–	–	–	–	–	–	–	–	–
	Attention	–	–	–	–	–	–	.727***	–	–	–	–	–	–	–
	Language	–	–	.823***	–	–	.546**	–	.557**	–	–	–	–	–	–
	Delayed Recall	–	–	–	–	–	–	–	.870***	.692***	–	–	–	–	–
	Orientation	.872***	–	–	–	–	–	–	–	–	–	–	–	–	–

Note. Orient = Orientation; Sent Constr = Sentence Construction; Sent Reading = Sentence Reading; Nonw Reading = Nonword Reading; Imme Recall (Free) = Immediate Recall (Free); Audit Attent = Auditory Attention; Delayed Recall (Recog) = Delayed Recall (Recognition); Number Reading = Number/ Price/ Time Reading; Instruct Compre. = Instruction Comprehension; SS = Spontaneous Speech; AQ = Aphasia Quotient; LQ = Language Quotient; *$p \leq .05$. ** $p \leq .01$. ***$p \leq .001$; A dash indicates that the correlations were not examined.

Table 4 displays the correlations between the HK-BCoS scores of each stroke participants and the corresponding scores in the CAB, the C-MMSE and the HK-MoCA. The Pearson's *r* coefficients were statistically significant for all correlations, except for the correlations between the complex figure copy in the HK-BCoS and the visuospatial/executive in the HK-MoCA, and the correlations between the delayed story recognition in the HK-BCoS and the delayed recall task in the C-MMSE. In general, the correlations were high between the HK-BCoS scores and the corresponding scores in the CAB, the C-MMSE and the HK-MoCA.

Table 5 displays the Pearson's *r* coefficients in the measures of intra-rater reliability, inter-rater reliability, test-retest reliability and split-half reliability of the HK-BCoS. The intra- and inter-rater reliability was .997 and .963, respectively, which were the highest among the four reliability measures. The test-retest reliability was .814 and the split-half reliability was .726. The Pearson's *r* coefficients for 11 sections in the HK-BCoS were statistically significant in all four reliability measures. In contrast, the Pearson's *r* coefficients for the sections of meaningless gesture imitation and complex figure copy were only statistically significant in one reliability measure out of the four measures. In general, the Pearson's *r* coefficients were high for the four reliability measures, particularly for intra-rater reliability and inter-rater reliability.

Table 5

Reliability Measures of the HK-BCoS

Section	**Score**	**Reliability measures**			
		Intra-rater	Inter-rater	Test-retest	Split-half
1a) Orientation – Personal Information	Total score	1.000***	1.000***	1.000***	.765***
1b) Orientation – Time and Space	Free response score	1.000***	1.000***	.999***	.731***
	Free response & MC score	#	#	#	#
1c) Orientation – Nosognosia	Total score	1.000***	1.000***	.645	.533*
2) Picture Naming	Total score	1.000***	.985*	.896*	.909***
3) Sentence Construction	Total score	1.000***	1.000***	.873	.698***

4) Sentence Reading	Total score	1.000***	.976*	.995***	.901***
5) Nonword Reading	Total score	1.000***	1.000***	.912*	.807***
6) Story Recall and Recognition – Immediate Recall	Free recall score	.998**	.998**	.876	.771***
	Free recall & Recognition score	1.000***	1.000***	.898*	.627**
7) Apple Cancellation	Total score	1.000***	1.000***	.932*	.985***
8) Visual Extinction	Left unilateral score	#	#	#	–
	Right unilateral score	#	#	#	–
	Left bilateral score	#	#	1.000***	–
	Right bilateral score	#	#	#	–
9) Tactile Extinction	Left unilateral score	#	#	#	–
	Right unilateral score	#	#	1.000***	–
	Left bilateral score	#	#	#	–
	Right bilateral score	1.000***	1.000***	#	–
10) Rule Finding and Concept Switching Test	Total score	.998**	.998**	.749	.862***
11) Auditory Attention	Total score	1.000***	1.000***	.980**	.968***
12) Story Recall and Recognition – Delayed Recall	Free recall score	.995**	1.000***	.876	.917***
	Free recall & Recognition score	1.000***	1.000***	.450	.733***
13) Multi-Step Object Use	Total score	1.000***	1.000***	.408	–
14) Gesture Production	Total score	.983*	.832	.918*	.636***
15) Gesture Recognition	Total score	1.000***	1.000***	.373	.249
16) Meaningless Gesture Imitation	Total score	1.000***	.577	-.783	-.132
17) Task Recall	Total score	1.000***	1.000***	.089	.338
18) Number/Price/Time Reading	Total score	1.000***	.975*	.975**	.899***
19) Number Writing	Total score	1.000***	1.000***	.942*	.842***
20) Calculation	Total score	1.000***	1.000***	.875	.589**
21) Word Writing	Total score	.997**	.988*	.926*	.830***
22) Complex Figure Copy	Total score	.947	.707	.601	.968***
23) Instruction Comprehension	Total score	1.000***	1.000***	1.000***	–
Average		.997	.963	.814	.726

Note. *$p \leq .05$. ** $p \leq .01$. ***$p \leq .001$; # indicates that the Pearson's *r* was unable to be computed since the scores in at least one group of the data were all identical; A dash indicates that the correlations were unable to be examined.

Discussion

This pilot study is the first attempt to validate the HK-BCoS, which is the first translated version in any language. The validity of the HK-BCoS was estimated via concurrent validity with other validated tests and four measures of reliability. The design of the current study of the HK-BCoS was generally similar to the validation study of the

HK-MoCA (Wong et al., 2009), which validated the HK-MoCA by studying relationship of the test with C-MMSE, capability of the test to discriminate between patients with cerebral small vessel disease and controls, internal consistency and reliability of the test. However, the sample size of stroke participants and controls in the current study was relatively small, when compared to the 40 patients and 40 controls in the study of the HK-MoCA (Wong et al., 2009) and compared to the 79 patients and 111 controls in the study of the C-MMSE (Chiu et al., 1994).

In general, the control group performed significantly better than the stroke group in 16 sections of the HK-BCoS, particularly in the sections testing sentence construction, delayed story recall, auditory attention and number, price and time reading. This finding suggested that the HK-BCoS was able to detect the presence of cognitive impairment in the domains of language, memory, attention and number processing. Although the performance of the stroke group in seven sections, which included recognition of time and space, apple cancellation, visual extinction, tactile extinction, rule finding and concept switching test, gesture production, and complex figure copy, were not significantly different to the performance of the control group, the stroke group generally scored lower than the control counterparts. All in all, the results revealed that most components of HK-BCoS were able to discriminate between stroke patients and matched controls.

This study has focused on HK-BCoS sections that involve language, given that 13 stroke participants were aphasic. The scores in the HK-BCoS sections including picture naming, sentence construction, free and delayed story recall, instruction comprehension, number and word reading, and number and word writing, were all strongly correlated to the corresponding scores (including spontaneous speech score, auditory comprehension score, naming score, reading score and writing score), the aphasia quotient (AQ) and the language quotient (LQ) obtained in the CAB, indicating that these sections were sensitive to the

presence and severity of aphasia in stroke patients. The scores in these sections of the HK-BCoS were highly correlated to the scores obtained in the language tasks in the C-MMSE and the HK-MoCA as well, further suggesting that these sections were able to detect the presence of language impairment in stroke patients.

Apart from language domain, the study examined the concurrent validity of the BCoS sections testing memory, attention, visuospaital skills and orientation. However, it is worth mentioning that the corresponding scores from the C-MMSE and the HK-MoCA for these cognitive domains were relatively crude, when compared to the language scores, the AQ and the LQ obtained in the CAB. The finding revealed that the scores in the HK-BCoS sections assessing memory, attention, visuospatial skills and orientation were significantly correlated to most tasks assessing the same cognitive domain in the C-MMSE and the HK-MoCA, except that the sections of complex figure copy and delayed story recognition in the HK-BCoS were not significantly correlated to the visuospatial/executive task in the HK-MoCA and the delayed recall task in the C-MMSE respectively. A possible reason for the low correlation between the section of complex figure copy in the HK-BCoS and the visuospatial/executive task in the HK-MoCA is that the visuospatial/ executive task in the HK-MoCA required more executive functions than the complex figure copy in the HK-BCoS. In the complex figure copy of the HK-BCoS, the stroke participants were only required to copy a two-dimensional complex figure. However, in the visuospatial/executive task of the HK-MoCA, they needed to draw a line to link up numbers in a specified pattern, copy a three-dimensional figure and draw a clock without copying. These tasks required more executive functioning and intact auditory comprehension of task instructions, and therefore were more demanding for the stroke participants. On the other hand, for the low correlation between the delayed story recognition in the HK-BCoS and the delayed recall task in the C-MMSE, it is possible that the delayed story recognition is much easier than the delayed

recall task in the C-MMSE for the aphasic participants, since free verbal response is not required for recognition in the HK-BCoS. Moreover, the multiple choices given to the participants in the delayed story recognition of the HK-BCoS might have provided additional cues about the story and therefore lower the degree of difficulty. To summarize, the HK-BCoS sections were generally able to detect deficits in the domains of memory, attention, visuospaital skills and orientation like the C-MMSE and the HK-MoCA do.

In addition, the HK-BCoS has excellent intra-rater and inter-rater reliability since the Pearson's *r* coefficients are greater than .90 (Cicchetti & Sparrow, 1990), indicating that scoring is consistent among different raters. However, the inter-rater reliability for the sections of gesture production, meaningless gesture imitation and complex figure copy was relatively low. It is possible that these sections required more subjective judgments than other sections in the HK-BCoS. For example, in the section of gesture production, the judgement of spatial errors, movement errors or incorrect sequence errors in the gestures produced may vary among different raters if the errors were not obvious. Similarly, in the section of gesture imitation, the rater had to judge the correctness of the gestures by the finger/hand position, spatial relationship between hand and head, and movement sequence. In the section of complex figure copy, subjective judgement on the shape, proportion and placement of each individual element in the complex figure was needed. To conclude, the involvement of more subjective judgments could account for the discrepancy between the scores by the two raters in these sections.

The HK-BCoS has good test-retest reliability since the Pearson's *r* coefficient is greater than .80 (Cicchetti & Sparrow, 1990), indicating that the results of the HK-BCoS are generally replicable. The fluctuations in the participants' performance on the HK-BCoS was possibly due to fatigue since it took at least 60 minutes for the stroke participants to complete the whole HK-BCoS, although the examiner attempted to reduce their fatigue by allowing

them to take a break whenever the need was noted. In addition, impairment in attention might impede their attention to the tasks and led to the fluctuation in their performance.

The split-half reliability of the HK-BCoS is fair since the Pearson's r coefficient is between .70 and .80 (Cicchetti & Sparrow, 1990), suggesting that the odd-numbered and even-numbered items in the same section are fairly good in measuring the same construct. The correlations were significant for 18 sections and only not significant for three sections, which included gesture recognition, meaningless gesture imitation and task recall. The low split-half reliability for the three sections may imply that the difficulty of the odd-numbered items and the even-numbered items were not well balanced and evenly distributed. A detailed review of the stroke participants' responses in these sections revealed that several items in these sections were particularly difficult for the participants, which may account for the imbalance between odd-numbered items and even-number items. For example, in the section of gesture recognition, six participants answered the odd-numbered item 'goodbye' incorrectly and four participants answered the odd-numbered item 'key' incorrectly while no more than two participants answered incorrectly for other four items. Similarly, in the section of task recall, 12 participants incorrectly answered the even-numbered item 'What did you have to read?' and seven participants incorrectly answered the even-numbered item 'Which gesture did I ask you to do?' while no more than five participants answered incorrectly for other eight items. The difficulty of particular items may account for the imbalance between the odd-number and even-numbered items in these section. On the other hand, in the section of meaningless gesture imitation, the relationship between the odd-numbered and even-numbered items were negatively correlated but not significant. A detailed review of the stroke participants' performance revealed that seven stroke participants produced errors in odd-numbered items only, four participants produced errors in even-numbered items only and only two participants produced errors in both odd-numbered

and even-numbered items. The finding suggested that a further review of each item in this section may be needed since the split-half reliability of this section is particularly poor. However, it is worth mentioning that the BCoS praxis tasks, including multi-step object use, gesture production, gesture recognition and gesture imitation, have been proved to be valid for detecting disorders of planned movement in stroke patients (Bickerton et al., 2012).

One limitation of the current study is that the effect of education level on a participant's performance in the HK-BCoS was not studied. In the validation study of the HK-MoCA (Wong et al., 2009), a significant positive relationship between education level and performance on the HK-MoCA was found. In this study, although the education level of control group was matched to the education level of stroke group, the effect of education level on the scores in the HK-BCoS was not studied since only very few stroke participants who attained primary school level only or had never received formal education were available for in-depth investigation. Further study with a larger sample size will be needed for studying the effect of education on the performance scores in the HK-BCoS. In addition, concurrent validity was not studied for all sections in the HK-BCoS, including the sections of visual extinction, tactile extinction, rule finding and concept switching test, multi-step object use, gesture production, gesture recognition, gesture imitation, task recall and calculation, since no valid counterpart tests are available in the CAB, the C-MMSE and the HK-MoCA. Although neuropsychological tests (apraxia, drawing and neglect) are available in the CAB, the tests were only tested on 14 aphasic subjects for preliminary study (Yiu, 1992). Therefore, the tests were not included in the current study. Further study on the concurrent validity of these BCoS sections will be needed. Furthermore, although how well the HK-BCoS can differentiate between stroke participants and healthy controls was studied, similar to the limitation of the validation study of the HK-MoCA (Wong et al., 2009), capability of the HK-BCoS to differentiate between stroke patients with and without

cognitive impairments was not studied, due to the lacking of formal diagnostic psychological assessments for the stroke subjects in this study. Further study on ability of the HK-BCoS to differentiate between stroke participants with and without cognitive impairments is recommended. This can be done by a detailed neuropsychological assessments for diagnosis of cognitive impairments before administration of the HK-BCoS.

It is believed that once the HK-BCoS is further validated with a larger sample size, it can be an important tool to be used for clinical screening and research purposes. Similar to the C-MMSE and the HK-MoCA, the HK-BCoS can be used by a variety of health professionals as a part of their assessments, in order to identify the impaired cognitive domain for in-depth investigation and recommendation of rehabilitation for better long-term outcome. For research purposes, the HK-BCoS can be used as a valid and reliable assessment tool to quantify stroke patient's cognitive ability in various domains for neuropsychological study in stroke. In addition, J. Riddoch, one of the BCoS developers, claimed that a shorter English version of the BCoS is under development (personal communication, January 15, 2013). It is reasonable to assume that a valid and reliable short version of the HK-BCoS will be as useful when it becomes available for Cantonese speakers in Hong Kong.

Conclusion

To conclude, the HK-BCoS is a valid and reliable assessment tool for assessing cognitive impairments in Cantonese-speaking stroke survivors in Hong Kong. It is believed that with the preliminary results obtained in the present study, the HK-BCoS can be further developed and becomes an important assessment tool to be widely used by a variety of health professionals for clinical screening and research purposes.

Acknowledgements

The author would like to thank the Hong Kong Society for Rehabilitation for the support in recruitment of participants and assistance in data collection. The author would also like to thank Prof. Brendan Weekes, Associate Dean (Research Higher Degrees) in the Division of Speech and Hearing Sciences at the University of Hong Kong, and Dr. Anthony Kong, Assistant Professor in the Department of Communication Sciences and Disorders at the University of Central Florida for their invaluable comments and suggestions to the study. Thanks also go to Mr. Johnny Lau, Doctoral Researcher in the School of Psychology at the University of Birmingham for training on administration of the HK-BCoS and assistance in data collection for establishment of inter-rater reliability.

References

Bickerton, W. -L., Riddoch, M. J., Samson, D., Balani, A. B., Mistry, B., & Humphreys, G. W. (2012). Systematic assessment of apraxia and functional predictions from the Birmingham Cognitive Screen. *Journal of Neurology, Neurosurgery & Psychiatry, 83*, 513-521. doi:10.1136/jnnp-2011-300968

Chiu, H. F. K., Lee, H. C., Chung, W. S., & Kwong, P. K. (1994). Reliability and validity of the Cantonese version of mini-mental state examination: a preliminary study. *Journal of the Hong Kong College of Psychiatrists, 4*, 25-28.

Cicchetti, D. V., & Sparrow, S. S. (1990). Assessment of adaptive behavior in young children. In J. H. Johnson and J. Goldman (Eds.), *Developmental assessment in clinical child psychology: A handbook* (pp. 173-196). New York: Pergamon Press.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). "Mini-mental state": A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research, 12*(3), 189-198. doi:10.1016/0022-3956(75)90026-6

Goodglass, H., & Kaplan, E. (1983). *The Assessment of Aphasia and Related Disorders* (2nd ed.). Philadelphia: Lea and Febiger.

Hallowell, B., & Chapey, R. (2008). Introduction to Language Intervention Strategies in Adult Aphasia. In R. Chapey (Ed.), *Language Intervention Strategies in Aphasia and Related Neurogenic Communication Disorders* (pp. 3-19). Baltimore, MD: Lippincott Williams & Wilkins.

Hoffmann, M., Schmitt, F., & Bromley, E. (2009). Comprehensive cognitive neurological assessment in stroke. *Acta Neurologica Scandinavica, 119*(3), 162-171. doi:10.1111/j.1600-0404.2008.01101.x

Hommel, M., Miguel, S. T., Naegele, B., Gonnet, N., & Jaillard, A. (2009). Cognitive determinants of social functioning after a first ever mild to moderate stroke at

vocational age. *Journal of Neurology, Neurosurgery & Psychiatry, 80*(8), 876-880. doi:10.1136/jnnp.2008.169672

Humphreys, G. W., Bickerton, W. -L., Samson, D., & Riddoch, M. J. (2012). *The Birmingham Cognitive Screen (BCoS)*. Psychology Press: London.

Kertesz, A. (1982). *Western Aphasia Battery*. New York: Grune and Stratton.

Leśniak, M., Bak, T., Czepiel, W., Seniów, J., & Członkowska, A. (2008). Frequency and Prognostic Value of Cognitive Disorders in Stroke Patients. *Dementia and Geriatric Cognitive Disorders, 26*(4), 356-363. doi:10.1159/000162262

Lincoln, N. B., Kneebone, I. I. Macniven, J. A. B., & Morris, R. C. (2011). *Psychological Management of Stroke*. Retrieved from http://www.hkuhk.eblib.com.au.eproxy1.lib.hku.hk/patron/

Mioshi, E., Dawson, K., Mitchell, J., Arnold, R., & Hodges, J. R. (2006). The Addenbrooke's Cognitive Examination Revised (ACE-R): a brief cognitive test battery for dementia screening. *International Journal of Geriatric Psychiatry, 21*(11), 1078-1085. doi:10.1002/gps.1610

Mlcoch, A. G., & Metter, E. J. (2008). Medical Aspects of Stroke Rehabilitation. In R. Chapey (Ed.), *Language Intervention Strategies in Aphasia and Related Neurogenic Communication Disorders* (pp. 42-63). Baltimore, MD: Lippincott Williams & Wilkins.

Nasreddine, Z. S., Philips, N. A., Bedirian, V., Charbonneau, S., Whitehead, V., Collin, I., … Chertkow, H. (2005). The Montreal Cognitive Assessment, MoCA: A Brief Screening Tool For Mild Cognitive Impairment. *Journal of the American Geriatrics Society, 53*(4), 695-699. doi:10.1111/j.1532-5415.2005.53221.x

Pendlebury, S. T., Cuthbertson, F. C., Welch, S. J. V., Mehta, Z., & Rothwell, P. M. (2010). Underestimation of Cognitive Impairment by Mini-Mental State Examination Versus

the Montreal Cognitive Assessment in Patients With Transient Ischemic Attack and Stroke. *Stroke, 41*, 1290-1293. doi:10.1161/STROKEAHA.110.579888

Wong, A., Xiong, Y. Y., Kwan, P. W. L., Chan, A. Y. Y., Lam, W. W. M., Wang, K., … Mok, V. C. T. (2009). The Validity, Reliability and Clinical Utility of the Hong Kong Montreal Cognitive Assessment (HK-MoCA) in Patients with Cerebral Small Vessel Disease. *Dementia and Geriatric Cognitive Disorders, 28*, 81-87. doi:10.1159/000232589

Yiu, E. M. -L. (1992) Linguistic Assessment of Chinese-speaking Aphasics: Development of a Cantonese Aphasia Battery. *Journal of Neurolinguistics*, *7*(4), 379-424. doi:10.1016/0911-6044(92)90025-R

Appendix A

HK-BCoS Examiner's Booklet

受測者 ID:

日期:

測試員:

BCoS: SET 1

伯明翰認知篩查:

第一套

測試員手冊

(香港粵語版)

所需材料

指導語

時間限制

可用於失語症患者的測試方式

目錄

1a. **預備測試–個人資料**

「***我會問你一些問題。***」
– 一個題項*最多* 15 秒 。
– 若最初三個題目*全部錯誤*或是*沒有回應*，就*停止*此部份測試 。
– 受測者口語表達不可靠時，要求他們寫下答案。

1. **你的名字是甚麼**：	
2. **你姓甚麼**：	
3. **你今年幾歲**：	
4. **你在甚麼時候出生(年,月,日)**：	
5. **你家住哪？** **（哪條街(路)，門牌幾號？ / 或哪一棟大廈，哪一層？）**：	
6. **你習慣用左手還是右手**：	❑ **左手** ❑ **右手** ❑ **雙手**
7. **你(以前)的工作是甚麼**：	
8. **你的最高學歷是甚麼**：	❑ **文盲** ❑ **高中** ❑ **小學** ❑ **大學或以上** ❑ **初中**
***受測者花費在教育/職前培訓的時間	年

施測情況
(1=正常； 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙; 7=不識字；8=其他: _____) _____

正確回答的數目
注：如因題項 1-3 全部錯誤或沒有回應而停止測驗, 得分=0/8 _____/8

回答模式 ❑ 口頭 ❑ 書面

請受測者分別用左、右手寫下自己的名字，判斷那只手較適合完成餘下測試 ❑ 左手 ❑ 右手

受測者對題目的理解程度
（1= 在測試員重復問題後依舊不太瞭解；2=在施測者重復問題後，通常會有較好的理解；3= 理解力高, 幾乎不太需要重復問題）
注：此部份評估應綜合考慮受測者以語言和非語言方式要求重復的情況

1b. **預備測試– 時間和空間**

測驗手冊第 1-7 頁。

「我會再問你一些問題 。」

- 若答案錯誤或沒有回應，就提供選項供受測者選擇。

- 一個題目*最多*15 秒 。
- 若最初三個題目*全部錯誤*或是*沒有回應*，就*停止*此部份測試。
- 直接提供選項 。

	自由回答	**選擇題选项**			
1.你現在在哪裡：		❑ 學校	❑ 醫院	❑ 在家	❑ 超級市場
2.你現在在哪個地區：		❑ 香港	❑ 新界	❑ 九龍	❑ 離島
3.現在是一天中的哪個時段：		❑ 早上	❑ 中午	❑ 下午	❑ 晚上
4.現在是幾月：		❑ 一月 ❑ 二月 ❑ 三月	❑ 四月 ❑ 五月 ❑ 六月	❑ 七月 ❑ 八月 ❑ 九月	❑ 十月 ❑ 十一月 ❑ 十二月
5.今天是星期幾：		❑ 星期一 ❑ 星期二	❑ 星期三 ❑ 星期四	❑ 星期五 ❑ 星期六	❑ 星期日
6.今年是哪一年：		❑ 1986	❑ 2013	❑ 2012	❑ 2011

針對自由回答 - 施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙; 7=不識字；8=其他: _____)	
針對自由回答 –正確回答的數目 注：如因題項 1-3 全部錯誤或沒有回應而停止測驗, 得分=0/6 注: 如因失語症而跳過自由作答，得分=NA	_____/6
針對選擇題 – 施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙; 7=不識字；8=其他: _____) 注: 如果受測者在自由回答部分回答全部正確, 記錄為"1"	_____
(自由回答 + 選擇題)– 正確回應的總數 (自由回答正確回應的個數+ 選擇題正確回應的個數) 注：如因題目 1-3 全部錯誤或沒有回應而停止測驗,得分=0/6	_____/6
受測者對題目的理解程度 (1= 在施測者重復過問題後依舊不太瞭解；2=在施測者重復問題後，通常會有較好的理解；3= 理解力高, 幾乎不太需要重復問題) 注：此部份評估應綜合考慮受測者以語言和非語言方式要求重復的情況	

1c. **預備測試–自知力**

「我仍然有一些問題要問你 。」

- 一個題目*最多*15 秒 。

1. 為甚麼你在這裡(/ 醫院裡)：	
2a. 你可以讓我看看你的右手嗎 ： 2b. 你可以讓我看看你的左手嗎 ：	
3. 在移動你的手或腳時， 你會覺得有困難嗎：	

施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字； 8=其他: _____)	_____
正確回應的數目	_____/3
受測者對題目的理解程度 (1= 在施測者重復過問題後依舊不太瞭解; 2=在施測者重復問題後，通常會有較好的理解；3= 理解力高, 幾乎不太需要重復問題)	

注：此部份評估應綜合考慮受測者以語言和非語言方式要求重復的情況

2. 圖片命名

測驗手冊第 8-30 頁。

「我會給你看一些圖片，然後請你告訴我圖片上的東西叫甚麼。」

-一張圖片*最多*15 秒。

-若最前面四個題項*全部錯誤*或是*沒有回應*就停止。

	真實反應
1.鈴鐺 / 響鐘	
2.熱水壺 /水煲	
3.葡萄／提子	
4.雨傘／遮	
5.梨子	
6.鑊鏟／鏟子	
7.葱／大蒜？	
8.洋葱	
9.蝙蝠	
10.菠蘿	
11.螺絲刀/螺絲批	
12.老虎	
13.鈎(子)	
14.板手/士巴拿	
15.草莓／士多啤梨	
16.鋸／手鋸	
17.豌豆/青豆／荷蘭豆	
18.蓮藕	
19.錘子/榔頭	
20.鬧鐘	
21.南瓜	

施測情況 _____

(1=正常； 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊； 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)

正確回應的數目 _____/21

注：如因題目 1-4 全部錯誤或沒有回應而停止測驗,得分=0/14

注:

1) 可接受同義字。

2) 視覺上相似的物體，例如「鬧鐘」誤認成「 掛鐘」是不被接受的。

3) 發音不准視為錯誤。

3. 句子建構

測驗手冊第 31-36 頁。

「我會給你看一張圖片，以及兩個詞。請你用一句句子來告訴我這個人在做甚麼，句子要包含這兩個詞。你的句子要符合你在照片上看到的。比如說，如果我給你看這張照片（展示例子）並且給你這兩個字：「糖」和「茶」，你可以說：『這個人把糖放進他的茶裡。』」

- 隨每一張圖片向受測者提供*下面列出的提示*，並*大聲念出*所提供的一對詞。
- 若受測者用多於一句話描述某張圖片，必須指導受測者改變措詞, 用一句話來描述。每一個圖片只允許改正(/改變措詞)一次。
- 遺漏其中一個詞視為錯誤，不需要糾正。

-一張圖片*最多*30 秒。

-如果受測者*沒有回答*第一張圖片，則*停止*此部分測驗。

提示	回答
1. 請你用一句句子來說明這一個人在做甚麼，句子要包含「書」與「背囊」這兩個詞。	

（例句：這個女孩把書放進她的背囊裡。 / **喱個女仔將本書放入背囊裡面。)**

□使用正確的主語（她、這個女孩）

□使用正確的動詞（放、拿）

□使用正確的賓語（書）

□使用正確的趨向補語（進、出）

注：可接受同義字。

2. 請你用一句句子, 來說明這一個人在做甚麼, 句子要包含「外套」與「男　生」這兩個詞。	

（例句：這個男生在幫這個女孩穿外套。 / **喱個**男生幫**喱個**女仔著外套。)

□使用正確的主詞（這個男生）

□使用正確的動詞（幫……穿/脫）

□使用正確的賓語 1（她、這個女孩）

□使用正確的賓語 2（外套）

注：可接受同義字。

施測情況 (1=正常;　沒有或停止測試，　由於：2=失語症; 3=視覺空間障礙; 4=意識模糊;　5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	
正確回應的數目 注：若因第一張圖片就沒有回應而停止測驗, 得分=0/8	**/8**
受測者對題目的理解程度 （1= 在施測者重復過問題後依舊不太瞭解；2=在施測者重復問題後，通常會有較好的理解；3= 理解力高, 幾乎不太需要重復問題） 注：此部份評估應綜合考慮受測者以語言和非語言方式要求重復的情況	

4. **句子朗讀**

測驗手冊第 37 – 40 頁，計時器。

-在給指導語時, 把句子遮蓋起來。

「***現在我會給你看一個句子，請盡量又流利又準確地大聲念出這個句子。當我說『開始』的時候，你就可以開始念***。」

-把印有句子的紙放在受測者面前，說***「開始」***並且記錄受測者念每一個句子的時間。

-當受測者念完最後一個字時, 便停止計時。

-如果受測者*完全沒有*念出第一個句子，便*中止*此部分測驗。

回答

1. 台 灣 幣 值 價 **格** 和 前 蘇 聯 **貼** 近 。

時間： **秒**

2. 警 界 在 村 民 **配** 合 下 ，

破 案 **特** 別 **精** 准 。

時間： **秒**

3. 顧 教 授 建 議 **改** 善

澳 洲 民 眾 之 健 康 。

時間： **秒**

施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	
總時間 （兩句所用時間總和） 注：若第一個句子就沒有回答，總時間則記錄為 N.A.	**秒**
正確回應的數目 （每多出一個字 扣一分） 注：若第一個句子就沒有回答，則得分= 0/47	**/40**

注：

1. 例外字下方有畫線標明。
2. 受測者自己改正錯誤則算對。
3. 發音錯誤或不准, 算錯。

5. **假詞閱讀**

測驗手冊第 41-45 頁，計時器。

「現在我會給你看一些假詞，也就是實際上並不存在的一些詞語。請盡量又流利又準確的大聲念出這些詞，當我說『開始』的時候你就可以開始讀。」

-把印有句子的紙放在受測者面前，說***「開始」***，並且記錄受測者讀每頁三個假詞的時間。

-受測者念完每頁最後一個字時便停止計時。

-如果受測者*完全沒有*讀出前三個假詞，則*停止*此部分測驗。

回答

1.	**個 到**	
2.	**人 我**	
3.	**會 對**	
4.	**一 是 得**	
5.	**下 了 為**	
6.	**行 子 港**	

答對詞語數目： **/3**

所用時間： **秒**

答對詞語數目： **/3**

所用時間： **秒**

施測情況 (1=**正常**; **沒有或停止測試**， **由於**：2=**失語症**; 3=**視覺空間障礙**; 4=**意識模糊**; 5=**疲勞**; 6=**肢體活動障礙**；7=**不識字**；8=**其他**:)	
總時間 **(兩組字所用時間總和)** **注：若前三個假詞就完全沒有回答，總時間則記錄為** N.A.	**秒**
正確回應的數目 **注：若前三個假詞就完全沒有回答，則得分=** 0/6	**/6**

6. **故事回想與再認**–1 **立即回想**

測驗手冊第 46-61 頁，計時器。

「現在，我給你念一個故事，這個故事只讀一次，請你務必專心聽這個故事，因為之後我會請你盡量說出這個故事的內容細節。」在讀故事之前請先確定受測者確實在聽你說話。

-故事只能讀*一次*，接著要求受測者自由回想這個故事的內容細節。

-自由回想*結束後*，針對受測者的錯誤回想 、不完整回想或是沒有回想到的部份，以選擇題的方式進行提問。

-在選擇題部分，受測者回答之後要給予*反饋*(如受測者答錯，跟他們確認正確答案)。

-*自由回想*的部份*最多*2 分鐘。

-如回想部份開始後 30 秒仍沒有回應，進行提醒; 如仍沒有回應，可每 30 秒重復提醒。

-*選擇題*部份每題*最多* 15 秒。

-若前五題都*答錯*或是*沒有回應*時，*直接給出*問題 6-12 的正確答案，並從問題 13 繼續提問。

-如果受測者沒有足夠的語言表達能力，直接進入選擇題的部份。

喺/上海/嚟嘅/楊太太/喺/超市/遇到佢嘅/鄰居/。佢同鄰居講：佢/琴日/去咗攞/退休金/，/喺銀行走出嚟嘅時候/被人搶嘢/。（嗰）兩個/睇起上嚟好似係/初中男生/嘅賊仔/喺佢手袋裡面/搶走咗/一千五百元/。一個經過嘅路人係/啱啱放咗工嘅警察/，喺/角落頭/捉住咗/班賊仔/。

片段	自由回想 1		再認 1（錯誤或是遺漏的部份）		
1)楊太太	*(1)* ❑*楊太太*	*(0.5)* ❑*女仕,太太或楊小姐或楊先生*	1) 故事中的主角是誰？ 1 **2** 3 4	*(1)* *(1)*	❑回想正確 ❑選擇題正確
2)上海	*(1)* ❑*上海*		2) 她從哪裡來的？ 1 2 **3** 4	*(1)* *(1)*	❑回想正確 ❑選擇題正確
3)鄰居	*(1)* ❑*鄰居*		3) 她遇到了誰？ 1 2 **3** 4	*(1)* *(1)*	❑回想正確 ❑選擇題正確
4)超級市場	*(1)* ❑超市/超級市場	*(0.5)* ❑*商店*	4) 她在哪裡遇到鄰居？ 1 2 3 **4**	*(1)* *(1)*	❑回想正確 ❑選擇題正確
5)被搶劫了	*(1)* ❑*搶劫*	*(0.5)* ❑*襲擊* */偷東西*	5) 她跟鄰居說了甚麼？ 1 **2** 3 4	*(1)* *(1)*	❑回想正確 ❑選擇題正確
6)昨天	*(1)* ❑*昨天*		6) 她甚麼時候被搶？ **1** 2 3 4	*(1)* *(1)*	❑回想正確 ❑選擇題正確
7)銀行	*(1)* ❑*從銀行走出來的時候*	*(0.5)* ❑*在銀行裡*	7) 她在哪裡被搶？ 1 2 3 **4**	*(1)* *(1)*	❑回想正確 ❑選擇題正確
8)退休金	*(1)* ❑*領退休金*	*(0.5)* ❑*去領退休金的路上*	8) 她去銀行做甚麼？ 1 2 **3** 4	*(1)* *(1)*	❑回想正確 ❑選擇題正確
9)兩個	*(1)* ❑*兩個*		9) 歹徒總共有幾個？ 1 2 3 **4**	*(1)* *(1)*	❑回想正確 ❑選擇題正確
10) 初中男生	*(1)* ❑*初中男生*	*(0.5)* ❑*男生* */初中生*	10) 歹徒是誰？ 1 2 3 **4**	*(1)* *(1)*	❑回想正確 ❑選擇題正確
11) 一千五百元	*(1)* ❑*一千五百元*		11) 他們搶了多少錢？ 1 2 3 **4**	*(1)* *(1)*	❑回想正確 ❑選擇題正確
12) 手袋	*(1)* ❑*手袋*	*(0.5)* ❑*袋 /錢袋*	12) 他們從哪裡搶走錢？ 1 2 **3** 4	*(1)* *(1)*	❑回想正確 ❑選擇題正確
13) 被捉住了	*(1)* ❑*被捉住了*		13) 歹徒最後怎麼了？ **1** 2 3 4	*(1)* *(1)*	❑回想正確 ❑選擇題正確
14) 放工的警察	(1) ❑*放工的警察*	*(0.5)* ❑*警察*	14) 誰捉住了歹徒？ **1** 2 3 4	*(1)* *(1)*	❑回想正確 ❑選擇題正確
15) 轉角處	*(1)* ❑*轉角處*		15) 歹徒在哪裡被捉住？ **1** 2 3 4	*(1)* *(1)*	❑回想正確 ❑選擇題正確

施測情況 (1=正常； 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊； 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
針對「自由回想」 – 總分(將所有 1 分和 0.5 分的加起來)	_____/15
針對「再認」– 施測情況 (1=正常； 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊； 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
自由回想 +再認的總分 (將 1 分的加起來，忽略 0.5 分的部份) 注：如果在選擇題部份跳過了第 6-12 題，則第 6-12 題的回答給予 0 分。	_____/15
注：同義字的回答得 1 分; 資料部分正確得 0.5 分。	

備注 (虛構 confabulations, 持續言語 perseverations 等):

7. **蘋果刪除**

受測者手冊、計時器。

「我會給你看一頁印滿蘋果圖案的圖畫，其中有一些是完整的蘋果，而有一些蘋果是有缺口的。你要把完整的蘋果劃掉。我們先來試試這個例子。」 給出例子並在必要時修正受測者的答案，最多只能進行兩次練習。

「現在我會給你一些時間在這張紙上做同樣的事情，並請你不要移動這張紙。」 將測驗的紙橫放在受測者面前，印有黑色三角形的部份靠近受測者，接著開始計時。

-在測驗時*不要*給受測者任何線索。

-練習時如果*沒有回應*就*停止*。

-作答時間***最多***5 分鐘。 3 分鐘過後，給受測者另一種顏色的筆，並要他們繼續。

透明膠片上的分隔區間:

區間 1 正確的個數: /5 虛報個數: **左**缺口 /5 **右**缺口 /5	**區間 3** 正確的個數: /5 虛報個數: **左**缺口 /5 **右**缺口 /5	**區間 5** 正確的個數: /5 虛報個數: **左**缺口 /5 **右**缺口 /5	**區間 7** 正確的個數: /5 虛報個數: **左**缺口 /5 **右**缺口 /5	**區間 9** 正確的個數: /5 虛報個數: **左**缺口 /5 **右**缺口 /5
區間 2 正確的個數: /5 虛報個數: **左**缺口 /5 **右**缺口 /5	**區間 4** 正確的個數: /5 虛報個數: **左**缺口 /5 **右**缺口 /5	**區間 6** 正確的個數: /5 虛報個數: **左**缺口 /5 **右**缺口 /5	**區間 8** 正確的個數: /5 虛報個數: **左**缺口 /5 **右**缺口 /5	**區間 10** 正確的個數: /5 虛報個數: **左**缺口 /5 **右**缺口 /5

施測情況 (1=正常； 沒有或停止測試，由於 : 2=失語症; 3=視覺空間障礙; 4=意識模糊； 5=疲勞; 6=肢體活動障礙 ; 7=不識字 ; 8=其他: _____)	_____
被划掉的完整蘋果的總數目	**____/50**
左缺口虛報的總數目	**____/50**
右缺口虛報的總數目	**____/50**
(完整蘋果)不對稱分數 (區間 7 + 8 + 9 + 10 答對的個數) 減掉 (區間 1 + 2 + 3 +4 答對的個數)	_____
(有缺口蘋果)不對稱分數 (左缺口虛報的總數目) 減掉 (右缺口虛報的總數目)	_____

8. 視覺消逝

- 坐在受測者的正前方，距離受測者約 1 米遠。
-舉起左右手的食指跟中指，放在自己頭的兩側 (距離鼻子約 20 厘米) 。
「*看著我的鼻子，不要轉動動你的眼睛。 我會動我左手的手指或是右手的手指，也有可能同時動我雙手的手指 ， 請你告訴我或用手指是哪邊的手指在動。但請記得要一直注視著我的鼻子 。*」
- 每一次動手指的動作：輕輕彎曲手指兩次 。
- 每個嘗試*最多*15 秒 。
- 若前三個嘗試全部*沒有回應*就*停止* 。

(右=右手; 左=左手; 雙 = 雙手):

移動的手 (實驗者視角)	受測者的反應	受測者視角 (正確反應)
右 雙 左		左 雙 右
雙 雙 右		雙 雙 左
雙 左 左		雙 右 右
雙 雙 左		雙 雙 右
右 雙		左 雙
右 雙		左 雙

施測情況 (1=正常; 沒有或停止測試 , 由於 : 2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙 ; 7= 不識字 ; 8=其他: _____)	_____
左單側 – 正確探測的個數 注：如因最前面三個嘗試完全沒有回應而停止測驗,得分 = 0	_____/4
右單側 – 正確探測的個數 注：如因最前面三個嘗試完全沒有回應而停止測驗,得分 = 0	_____/4
左雙側 – 正確探測的個數 注：如因最前面三個嘗試完全沒有回應而停止測驗,得分 = 0	_____/8
右雙側 – 正確探測的個數 注：如因最前面三個嘗試完全沒有回應而停止測驗,得分= 0	_____/8

注：若受測者把單側刺激視為雙側刺激，則計為錯誤。

9. **觸覺消逝**

- 坐在受測者的正前方 。
  「把你的雙手放在膝蓋上 （ 若病人是躺在床上，請病人把手放在床單上 ）。 ***現在閉上眼睛，我會碰你的左手或是右手， 也有可能同時碰你的雙手，請說出或向我指示我碰的是你的哪一隻手。 請記得閉著你的眼睛 。」***
- 確認受測者是坐直或躺正並且身體處於對稱狀態 （手或腳沒有交叉 ）。
- 每個試次的動作: 輕點受測者的手背兩次 。
- 每個試次*最多* 15 秒 。
- 若前 3 個試次全部*沒有回應*就*停止* 。

(右=右手; 左=左手; 雙=双手):

碰觸的手 (實驗者視角)	**受測者的反應**	**受測者視角 （正確反應）**
雙 雙 左		雙 雙 右
雙 左 雙		雙 右 雙
雙 右 右		雙 左 左
雙 雙 右		雙 雙 左
雙 左		雙 右
右 左		左 右

施測情況 (1=正常; 沒有或停止測試， 由於 : 2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙 ; 7= 不識字 ; 8=其他: _____)	_____
左單側 – 正確探測的個數 注：如因最前面三個嘗試完全沒有回應而停止測驗,得分 = 0	_____/4
右單側 – 正確探測的個數 注：如因最前面三個嘗試完全沒有回應而停止測驗,得分 = 0	_____/4
左雙側 – 正確探測的個數 注：如因最前面三個嘗試完全沒有回應而停止測驗,得分 = 0	_____/8
右雙側 – 正確探測的個數 注：如因最前面三個嘗試完全沒有回應而停止測驗,得分 = 0	_____/8

注：若受測者把單側刺激視為雙側刺激，則計為錯誤。

10. **伯明翰規則轉換及發現**

測驗手冊第 62 – 86 頁。

「***你會看到一個三十六宮格，裡面有一個黑點。請你指出黑點的位置。***」

如果受測者無法指出黑點的所在，測試員就要用手指指出來黑點在哪裡。接著再一次要求受測者指出黑點的位置〈這只是要確認受測者能夠做指向黑點的動作〉。若受測者在第二次嘗試時仍無法可靠地做出這個動作，則停止。

「好，這個黑點在接下來的每一頁會出現在不同的位置，它可能會出現在灰色的方格裡，也可能會出現在有顏色的方格中。這個黑點並不是隨意移動的，它會遵循一個規律，但是這個規律可能會改變。請仔細看這個黑點每次是如何移動的，並告訴我你預期黑點接下來會出現在哪個位置。請保持注意力集中，這樣你才能發現它的移動規律的變化。」

-向受測者呈現練習試次，並說：***「舉個例子來說，如果這個黑點現在在這裡，然後移動到這裡來***〈呈現練習試次的第二頁〉***，那請告訴我這個黑點接下來最有可能出現的位置在哪裡？***(呈現練習試次的第三頁) 」

-必要的話修正受測者在練習試次第三頁的答案。

-呈現新一張圖片時，*務必*將之前一張放在新一張的正上方，好讓受測者可以看到上一個頁。

-呈現圖片時，用手指出黑點的位置。

-如果受測者不知道答案，叫他們猜猜看 。

- 每頁*最多* 15 秒。

-在第 11 頁前（包括第 11 個）正確的回應*低於 2 個*，就可以*停止*。

	規則	刺激	正確反應	實際反應	正確率 0/1	
1	向右	B3	任何			
2	向右	C3	D3			
3	向右	D3	E3			
4	向右	E3	F3			Cd switch
5	向紅色	B5	E3			
6	向紅色	E3	B5			
7	向紅色	B5	E3			
8	向紅色	E3	B5			
9	向紅色	B5	E3			
10	向紅色	E3	B5			
11	向紅色	B5	E3			Wd switch
12	向紅色	E6	B5			
13	向綠色	B5	E6			
14	向紅色	E6	B5			
15	向綠色	B5	E6			
16	向紅色	E6	B5			
17	向綠色	B5	E6			
18	向紅色	E6	B5			
19	向綠色	B5	E6			

施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
測驗前指向分數 (2=第一次嘗試就正確; 1=第二次嘗試才正確; 0=無法正確做出指向動作)	_____
正確回應的數目 注：如果在第 11 個試次仍無反應而停止測驗， 則得分=第 11 個試次前正確回應的數目/ 18	_____**/18**
正確偵測規則的數目 **(至少連續兩個試次正確才算) 注：如果在第 11 個試次仍無反應而停止測驗，則得分=第 11 個試次前正確偵測的規則數目/3	_____**/3**
受測者對題目的理解程度 (1= 在施測者重復過問題後依舊不太瞭解；2=在施測者重復問題後，通常會有較好的理解；3= 理解力高，幾乎不太需要重復問題) 注：此部份評估應綜合考慮受測者以語言和非語言方式要求重復的情況	

11. **聽覺注意**

錄音和測驗手冊第 87 – 91 頁(適用於失語症病人)。

「***你會聽到錄音帶中有一個女人念不同的詞。當這個女人說 『您好』,『唔該』或是『錯』時，你必須要拍桌子。當他說其他的詞時，不要拍桌子。所以你必須要拍桌子的詞為：您好、唔該、錯。你可以先重復說一下這幾個字詞嗎？」***（如果受測者不能回想起這三個字詞，再重復一次這些詞）***「我們先來練習一次。」***

-當下面的指示作此要求時，請受測者說出那三個目標詞。

-反復練習直到受測者在一個練習區塊中沒有任何錯誤，*或是*可以在練習之後正確回想三個目標詞。如果在三個練習區塊後都無法達到以上要求，*只有*在受測者對至少一個任意字詞拍打桌子（不管對或錯）的情況下，才繼續這個測驗。

-*在任何一區塊*中（區塊一*或*區塊二）中，若有*超過 8 個錯誤*就*停止*，但謹記在最後*要求受測者說出*三個目標詞。

(適用於失語症病人)– 問哪些是目標詞時，呈現選擇題項。

練習一

「請你告訴我，哪三個字詞是你必須要拍桌子回應的？」_____

1. 唔該	❑ **拍**	❑ 不拍
2. 多謝	❑ 拍	❑ **不拍**
3. 再見	❑ 拍	❑ **不拍**
4. 您好	❑ **拍**	❑ 不拍
5. 啱	❑ 拍	❑ **不拍**
6. 錯	❑ **拍**	❑ 不拍

「你可以告訴我哪三個字詞是你必須要拍桌子回應的？」_____

練習二 (如果有需要的話)

「請你告訴我，哪三個字詞是你必須要拍桌子回應的？」_____

1. 唔該	❑ **拍**	❑ 不拍
2. 多謝	❑ 拍	❑ **不拍**
3. 再見	❑ 拍	❑ **不拍**
4. 您好	❑ **拍**	❑ 不拍
5. 啱	❑ 拍	❑ **不拍**
6. 錯	❑ **拍**	❑ 不拍

「你可以告訴我哪三個字詞是你必須要拍桌子回應的？」_____

練習三 (如果有需要的話)

「請你告訴我，哪三個字詞是你必須要拍桌子回應的？」_____

1. 唔該	❑ **拍**	❑ 不拍
2. 多謝	❑ 拍	❑**不拍**
3. 再見	❑ 拍	❑**不拍**
4. 您好	❑ **拍**	❑不拍
5. 啱	❑ 拍	❑**不拍**
6. 錯	❑ **拍**	❑不拍

「你可以告訴我哪三個字詞是你必須要拍桌子回應的？」_____

****測驗****

區塊 1

您好	❑ **拍**	❑ 不拍
多謝	❑ 拍	❑ **不拍**
再見	❑ 拍	❑ **不拍**
啱	❑ 拍	❑ **不拍**
唔該	❑ **拍**	❑ 不拍
錯	❑ **拍**	❑ 不拍
啱	❑ 拍	❑ **不拍**
多謝	❑ 拍	❑ **不拍**
錯	❑ **拍**	❑ 不拍
您好	❑ **拍**	❑ 不拍
再見	❑ 拍	❑ **不拍**
唔該	❑ **拍**	❑ 不拍
啱	❑ 拍	❑ **不拍**
唔該	❑ **拍**	❑ 不拍
多謝	❑ 拍	❑ **不拍**
再見	❑ 拍	❑ **不拍**
您好	❑ **拍**	❑ 不拍
錯	❑ **拍**	❑ 不拍

區塊 3

啱	❑ 拍	❑ **不拍**
唔該	❑ **拍**	❑ 不拍
啱	❑ 拍	❑ **不拍**
錯	❑ **拍**	❑ 不拍
唔該	❑ **拍**	❑ 不拍
再見	❑ 拍	❑ **不拍**
多謝	❑ 拍	❑ **不拍**
再見	❑ 拍	❑ **不拍**
錯	❑ **拍**	❑ 不拍
多謝	❑ 拍	❑ **不拍**
您好	❑ **拍**	❑ 不拍
唔該	❑ **拍**	❑ 不拍
多謝	❑ 拍	❑ **不拍**
錯	❑ **拍**	❑ 不拍
您好	❑ **拍**	❑ 不拍
啱	❑ 拍	❑ **不拍**
再見	❑ 拍	❑ **不拍**
您好	❑ **拍**	❑ 不拍

***「請你告訴我，哪三個字詞是你必須要拍桌子回應的？」*

_____

區塊 2

您好	❑ **拍**	❑ 不拍
錯	❑ **拍**	❑ 不拍
啱	❑ 拍	❑ **不拍**
唔該	❑ **拍**	❑ 不拍
再見	❑ 拍	❑ **不拍**
錯	❑ **拍**	❑ 不拍
再見	❑ 拍	❑ **不拍**
唔該	❑ **拍**	❑ 不拍
啱	❑ 拍	❑ **不拍**
您好	❑ **拍**	❑ 不拍
多謝	❑ 拍	❑ **不拍**
再見	❑ 拍	❑ **不拍**
錯	❑ **拍**	❑ 不拍
您好	❑ **拍**	❑ 不拍
多謝	❑ 拍	❑ **不拍**
啱	❑ 拍	❑ **不拍**
多謝	❑ 拍	❑ **不拍**
唔該	❑ **拍**	❑ 不拍

	區塊 1	區塊 2	區塊 3

正确回應的数目:	**/18**	**/18**	**/18**
虛報的数目:	**/9**	**/9**	**/9**
漏報的数目:	**/9**	**/9**	**/9**

施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
正確回應的總數目 注: 如果完成區塊一或二後就停止，得分=測驗停止前正確回應的總數 / 54	_____**/54**
虛報的總數目 注: 如果完成區塊一或二後就停止，得分=測驗停止前虛報的總數/27	_____**/27**
漏報的總數目 注: 如果完成區塊一或二後就停止，得分=停止前漏報的總數/27	_____**/27**
持續注意的指標 (區塊一正確回應的數目減去區塊三正確回應的數目) 注: 如果完成區塊一或二後就停止，則標示為 NA	_____
回想目標詞的方式	❑ 自由回想 ❑選擇題
練習次數	_____**/3**
測驗結束後還記得多少個目標詞	_____**/3**
受測者對題目的理解程度 (1= 在施測者重復過問題後依舊不太瞭解；2=在施測者重復問題後，通常會有較好的理解；3= 理解力高, 幾乎不太需要重復問題) 注：此部份評估應綜合考慮受測者以語言和非語言方式要求重復的情況	

12. 故事回想與再認– 2 延遲回想

測驗手冊第 92 – 107 頁，計時器。

「 之前我跟你說了一個故事，請你現在告訴我故事的內容，要包括細節的部份。」

-*不要*重新念故事。

-自由回想結束後，針對受測者的錯誤回想 、不完整回想或是沒有回想到的部份，以選擇題的方式進行提問。

-*不需要*給予反饋。

-*自由回想*的部份*最多* 2 分鐘。

-如回想部份開始後 30 秒沒有回應，進行提醒 ； 如仍沒有回應,可每 30 秒重復提醒。

-*選擇題*的部份每題*最多* 15 秒。

-若前五題*都答錯*或是*沒有回應*時，*直接給出*問題 6-12 的正確答案，並從問題 13 繼續提問。

-如果受測者沒有足夠的語言表達能力，就直接進入選擇題的部份。

片段	**自由回想 1**	**再認 1 (錯誤或是遺漏的部份)**

1) 楊太太	*(1)* ❑*楊太太*	*(0.5)* ❑*女仕,太太或楊小姐或楊先生*	1) 故事中的主角誰？ 1 2 3 **4**	*(1)* ❑回想正確 *(1)* ❑選擇題正確
2) 上海	*(1)* ❑*上海*		2) 她從哪裡來的？ **1** 2 3 4	*(1)* ❑回想正確 *(1)* ❑選擇題正確
3) 鄰居	*(1)* ❑*鄰居*		3) 她遇到了誰？ 1 2 **3** 4	*(1)* ❑回想正確 *(1)* ❑選擇題正確
4) 超級市場	*(1)* ❑超市/*超級市場*	*(0.5)* ❑*商店*	4) 她在哪裡遇到鄰居？ 1 2 3 **4**	*(1)* ❑回想正確 *(1)* ❑選擇題正確
5) 被搶劫了	*(1)* ❑*搶劫*	*(0.5)* ❑*襲擊* /*偷東西*	5) 她跟鄰居說了麼？ 1 2 **3** 4	*(1)* ❑回想正確 *(1)* ❑選擇題正確
6)昨天	*(1)* ❑*昨天*		6) 她甚麼時候被搶？ 1 **2** 3 4	*(1)* ❑回想正確 *(1)* ❑選擇題正確
7)銀行	*(1)* ❑*從銀行走出來的時候*	*(0.5)* ❑*在銀行裡*	7) 她在哪裡被搶？ 1 **2** 3 4	*(1)* ❑回想正確 *(1)* ❑選擇題正確
8)退休金	*(1)* ❑*領退休金*	*(0.5)* ❑*去領退休金的路上*	8) 她去銀行做甚麼？ **1** 2 3 4	*(1)* ❑回想正確 *(1)* ❑選擇題正確
9)兩個	*(1)* ❑*兩個*		9) 歹徒總共有幾個？ 1 **2** 3 4	*(1)* ❑回想正確 *(1)* ❑選擇題正確
10)初中男生	*(1)* ❑*初中男生*	*(0.5)* ❑*男生* /*初中生*	10) 歹徒是誰？ 1 2 **3** 4	*(1)* ❑回想正確 *(1)* ❑選擇題正確
11)一千五百元	*(1)* ❑*一千五百元*		11) 他們搶了多少錢？ **1** 2 3 4	*(1)* ❑回想正確 *(1)* ❑選擇題正確
12)手袋	*(1)* ❑*手袋*	*(0.5)* ❑*袋 /錢袋*	12) 他們從哪裡搶走錢？ 1 2 3 **4**	*(1)* ❑回想正確 *(1)* ❑選擇題正確
13)被捉住了	*(1)* ❑*被捉住了*		13) 歹徒最後怎麼了？ 1 2 3 **4**	*(1)* ❑回想正確 *(1)* ❑選擇題正確
14) 放工的警察	*(1)* ❑*放工的警察*	*(0.5)* ❑*警察*	14) 誰捉住了歹徒？ **1** 2 3 4	*(1)* ❑回想正確 *(1)* ❑選擇題正確
15) 轉角處	*(1)* ❑*轉角處*		15) 歹徒在哪裡被捉住？ 1 2 **3** 4	*(1)* ❑回想正確 *(1)* ❑選擇題正確

針對「自由回想」– 施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
針對「自由回想」 – 總分 (將所有 1 分和 0.5 分的加起來)	_____/15
針對「再認」– 施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
自由回想 +再認的總分 (將 1 分的加起來，忽略 0.5 分的部份) 注：如果在選擇題部份跳過了第 6-12 題，則第 6-12 題的回答得 0 分。	_____/15

13. **多步驟物體使用**

測驗手冊第 108 – 109 頁，袋子中的物體。

-將以下物品按以下順序排列成一直線，並放在受測者的正前方：*（最接近受測者）火柴、電池，膠水，螺絲起子，手電筒（離受測者最遠）。*

-讓受測者看正在發光的手電筒的圖片。

「請你讓手電筒亮起來，你需要的東西都在這裡，請努力完成。」

-若受測者為單側損傷的患者，實驗者可以幫忙，例如：當受測者發出請求或表現出適當的起始動作時，可以幫受測者扶住手電筒。

-觀察受測者的動作比即時在紙上紀錄評分重要。

- 如果超過 30 秒受測者還沒開始任何步驟(由於一些無意義的行為)，則重復指導語並再呈現一次圖片。

-若受測者仍*沒有開始*任何動作，就*停止*

步驟	**順序**	**描述**
打開手電筒筒身		
放進電池		
關閉手電筒的筒身		
點亮手電筒		
其他:		

對於以下每一個指標，只考慮受測者*第一次*企圖嘗試完成該步驟的表現。若初次嘗試完成該步驟的表現是正確的，給予 1 分。

*在實驗者沒有給予任何線索的情況下，*從鬆開筒身開始 （或在確定手電筒是否能點亮之後)	❑0 分 ❑1 分
打開後，填塞筒身	❑0 分 ❑1 分
從圓筒開口處裝入電池	❑0 分 ❑1 分
裝完兩顆電池	❑0 分 ❑1 分
裝完電池後關閉筒身	❑0 分 ❑1 分
蓋子放在正確的位置並鎖緊	❑0 分 ❑1 分
關閉筒身後開啓手電筒的開關	❑0 分 ❑1 分
最多只進行兩次嘗試後便以正確的方式裝入電池	❑0 分 ❑1 分
手電筒亮了	❑0 分 ❑1 分
沒有使用其他不相關的物品	❑0 分 ❑1 分
沒有針對目標物品做出不相關的動作	❑0 分 ❑1 分
沒有持續重復同樣的動作	❑0 分 ❑1 分
施測情況 (1=正常； 沒有或停止測試，由於：2=失語症; 3=視覺空間障礙; 4=意識模糊； 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
使用的手	❑ 只使用左手 ❑ 只使用右手 ❑ 雙手
總分(把得分全部加起來)	_____/12

14.手勢運用

測驗手冊第 110-126 頁。

「這是『安靜』的手勢。」 給受測者看字詞並做出該手勢。
「**現在我會要求你做一些手勢，請你盡量準確地做。你可以用你的右手（或左手）做出...的手勢嗎？」** 選擇受測者較靈活的那只手。
-展示詞語並大聲念出每一個手勢的名稱，一次一個。
-要求受測者使用他/她較靈活的手。

-每個題目*最多*15 秒。

不及物手勢	**得分****	**扣分原因 / 備注**
1.走路(用手指模擬)	❑ **2 分** ❑ **1 分** ❑ **0 分**	
2.行軍禮	❑ **2 分** ❑ **1 分** ❑ **0 分**	
3.停止(只用一隻手)	❑ **2 分** ❑ **1 分** ❑ **0 分**	
4.(有關)錢	❑ **2 分** ❑ **1 分** ❑ **0 分**	
5.勝利	❑ **2 分** ❑ **1 分** ❑ **0 分**	**一定要描述：**
	總分: **/10**	

**0 分: (1) 15 秒後沒有回應，或 (2) 做出無法辨別的手勢，或 (3) 保留之前做過的手勢。

1 分: 可辨認但不準確的手勢, 例如：*空間上*的錯誤（如：行軍禮的時候，手碰臉頰而非前額）或*動作上*的錯誤（如：對於走路的動作，食指和中指交叉，但往身體移動或沒做出走路的動作）。

2 分: 正確且準確的手勢。

＃＃＃無論受測者犯甚麼錯誤，都請注明於"備注"一欄。＃＃＃

重復之前的程序，但說：
「我會跟你說一個東西的名稱，請你假裝那個東西正在你手中。然後我會問你如何使用這個東西。舉個例子來說，如果我要你示範怎麼使用 」
『牙刷』，你會做出這樣的手勢（做出手勢）。***現在，請問你怎麼使用...？***」
-展示詞語並大聲念出每一個手勢的名稱，一次一個。

-每個題目*最多*15 秒。

及物手勢	**得分****	**扣分原因 / 備注**
1. 假裝你的手中有一個**玻璃杯**	❑**2 分** ❑**1 分** ❑**0 分**	
2. 假裝你的手中有一個**胡椒粉樽**	❑**2 分** ❑**1 分** ❑**0 分**	
3. 假裝你的手中有一把**鐵錘**	❑**2 分** ❑**1 分** ❑**0 分**	
4. 假裝你的手中有一個**煲斗**	❑**2 分** ❑**1 分** ❑**0 分**	
5. 假裝你的手中有一個**搔背的『不求人』**	❑**2 分** ❑**1 分** ❑**0 分**	
	總分: **/10**	

**0 分: (1) 15 秒後沒有回應，或 (2) 做出無法辨別的手勢 (例如：'鐵錘'- 做出揮手的手勢),或 (3) 保持之前做過的手勢。

1 分: 可辨認出但不準確的手勢, 例如：空間上的錯誤（'玻璃杯'：水往胸口倒而非口中; '玻璃杯' 和 '胡椒粉瓶'： 沒有留任何空間給手中的物體，但若沒留空間給 '鐵錘'，不應算錯）或不正確的握法（'鐵錘'：與前臂成垂直狀地握住）或動作上的錯誤（'鐵錘'：擺動太小, 未能有效地運用錘子; '胡椒粉瓶' ：灑胡椒粉的擺動太大）或不完整的動作（胡椒粉瓶：正確的握住但是沒有搖動它）或特定具體化（concretisation），例如：使用不相干的物體或是身體的其他部位（握另一隻手或是一支筆，假裝那是鐵槌，玻璃杯或是胡椒粉瓶）

2 分: 正確且準確的手勢。

＃＃＃ 無論受測者犯甚麼錯誤，都請注明於"備注"一欄。＃＃＃

施測情況 (1=正常； 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊； 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
使用的手	❑ 左手

	❑ 右手
總分 (把不及物手勢和及物手勢兩部份的分數加起來)	_____/20

15. 手勢識別

測驗手冊第 127-139 頁

「*我現在會做個手勢，我希望你選一個符合這手勢的意思。例如：我做這個手勢*（『安靜』的手勢，同時一邊讀並一邊給受測者看多重選項時，重復此手勢)，*我會給你幾個選項：數東西、安靜、你好、想問題；而『安靜』是符合這手勢的意思。現在，我做這個手勢，它是甚麼意思？*）」

-一邊讀一邊給受測者看多重選項，同時一定要重復該手勢

-每個題目*最多*15 秒。

不及物手勢			**反應**	
1. (好)	❑叫出租車	❑ 鼓掌	❑ 我發誓	❑ **好**
2. (過来) 把手往自己的方向擺動	❑ **過來**	❑ 敬禮	❑ 走開	❑ 不要
3. (再見) 從左往右動	❑ 停	❑ **再見**	❑ 可以	❑ 謝謝

總分: /3

同樣的程序，但說：

「*我現在會用手勢假裝使用一個東西，我希望你能選出我在假裝使用的東西。例如：我做這個手勢* (做用牙刷刷牙的手勢，當一邊讀並一邊給受測者看多重選項時，重復此手勢), *然後給你這些選項：牙線、剃刀、牙刷、水果刀; 而牙刷是正確的答案。現在如果我做這手勢，我在假裝用甚麼東西？*」

-一邊讀出並一邊給受測者看多重選項，同時一定要重復該手勢

-每個題目*最多*15 秒。

	反應			
1. 梳子	❑ 牙刷	❑ 扇子	❑ **梳子**	❑ 剪刀
2. 鑰匙	❑ **鑰匙**	❑ 水龍頭	❑ 門鈴	❑ 門把
3. 打火機	❑ 槍	❑ 火柴	❑ 電筒	❑**打火機**

總分: /3

施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
總分 (把不及物和及物手勢詞兩部份的分數加起來)	_____/6

16a. **模仿(無意義的)手勢: 針對右利手受測者**

-坐在受測者的正前方

「***我會做一些動作，這些動作並沒有任何意思，但請盡你所能模仿我所做的動作。我會使用這隻手***（用左手），***請你模仿並用這隻手做給我看***（碰觸受測者右手）。***舉個例子來說，如果我舉起這隻手***(舉手)，***你必須舉起你這隻手*** (碰觸受測者應該舉起的手)。***請你仔細觀察我手的位置，然後模仿我，你要等我做完動作後才能夠開始模仿。」 「這是一系列動作。」*** 在這個序列中每個手勢要持續 2 秒，接著告訴受測者 ***「現在該你做了」***。

-確認受測者在你*完成示範之後才開始*做動作。

-若受測者的手勢不正確或不精確，重復示範手勢一次(只重復*一次*)。

每個題目*最多* 15 秒。

重要！使用你的*左手*示範手勢，受測者則應該使用他/她的*右手*

手部	**得分**	**備注**
1. 	❑ 3 分 (在第一次示範後，就正確無誤地做出動作) ❑ 2 分 (在第二次示範後，就正確無誤地做出動作) ❑ 1 分 (在第二次示範後，只有*一個錯誤*-'錯誤'的標準見註解*) ❑ 0 分 (第二次示範後, 仍有多於一個錯誤、沒有作出任何反應、或是有連續性行為)	
2. 	❑ 3 分 (在第一次示範後，就正確無誤地做出動作) ❑ 2 分 (在第二次示範後，就正確無誤地做出動作) ❑ 1 分 (在第二次示範後，只有*一個錯誤*-'錯誤'的標準見註解*) ❑ 0 分 (第二次示範後, 仍有多於一個錯誤、沒有作出任何反應、或是有連續性行為)	
總分:	**/6**	

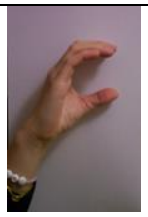
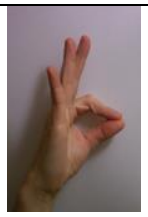
*1 分：(在第二次嘗試時) *只出現*以下錯誤之一:

- 不正確的手指或手掌位置
- 手和頭部的空間關係不正確
- 不完整的動作序列

(參考附錄：錯誤和得分的例子)

✎ ***「現在仔細看我的手指，然後模仿我手指的動作。請你等我完成動作後再開始模仿。首先，是這個手勢……」*** 展示手勢兩秒，然後告訴受測者 ***「現在輪到你做了。」***
-確認受測者在你*完成示範之後才開始*做動作。
-若受測者的手勢不正確或不精確，重復示範手勢一次(只重復*一次*)。
◷ -每個題目*最多*15 秒。

重要！使用你的*左手*示範手勢，受測者則應該使用他/她的*右手*

手指	得分	備注
1. 	❑ 3 分 (在第一次示範後，就正確無誤地做出動作) ❑ 2 分 (在第二次示範後，就正確無誤地做出動作) ❑ 1 分 (在第二次示範後，只有*一個錯誤*–'錯誤'的標準見註解*) ❑ 0 分 (第二次示範後, 仍有多於一個錯誤、沒有作出任何反應、或是有連續性行為)	
2. 	❑ 3 分 (在第一次示範後，就正確無誤地做出動作) ❑ 2 分 (在第二次示範後，就正確無誤地做出動作) ❑ 1 分 (在第二次示範後，只有*一個錯誤*–'錯誤'的標準見註解*) ❑ 0 分 (第二次示範後, 仍有多於一個錯誤、沒有作出任何反應、或是有連續性行為)	
總分:	**/6**	

*1 分：(在第二次嘗試時) *只出現*以下錯誤之一:
- 手指姿勢正確但是手掌位置不正確

施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
使用的手	❑ 左手 ❑ 右手
總分 (把手部和手指兩部分的分數加起來)	_____/12

16b. **模仿(無意義的)手勢: 針對左利手受測者**

-坐在受測者的正前方

「***我會做一些動作，這些動作並沒有任何意思，但請盡你所能模仿我所做的動作。我會使用這隻手***（用右手）***，請你模仿並用這隻手做給我看***（碰觸受測者左手）***。舉個例子來說，如果我舉起這隻手***(舉手)***，你必須舉起你這隻手*** (碰觸受測者應該舉起的手)***。請你仔細觀察我手的位置，然後模仿我，你要等我做完動作後才能夠開始模仿。」 「這是一系列動作。」*** 在這個序列中每個手勢要持續 2 秒，接著告訴受測者 ***「現在該你做了」***。

-確認受測者在你*完成示範之後才開始*做動作。

-若受測者的手勢不正確或不精確，重復示範手勢一次(只重復*一次*)。

每個題目*最多*15 秒。

重要！使用你的*右手*示范手勢，受測者則應該使用他/她的*左手*

手部	**得分**	**備注**
1. 	❑ 3 分 (在第一次示範後，就正確無誤地做出動作) ❑ 2 分 (在第二次示範後，就正確無誤地做出動作) ❑ 1 分 (在第二次示範後，只有*一個錯誤*-'錯誤'的標準見註解*) ❑ 0 分 (第二次示範後, 仍有多於一個錯誤、沒有作出任何反應、或是有連續性行為)	
2. 	❑ 3 分 (在第一次示範後，就正確無誤地做出動作) ❑ 2 分 (在第二次示範後，就正確無誤地做出動作) ❑ 1 分 (在第二次示範後，只有*一個錯誤*-'錯誤'的標準見註解*) ❑ 0 分 (第二次示範後, 仍有多於一個錯誤、沒有作出任何反應、或是有連續性行為)	
總分:	**/6**	

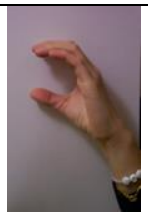
*1 分：(在第二次嘗試時) *只出現*以下錯誤之一:

- 不正確的手指或手掌位置
- 手和頭部的空間關係不正確
- 不完整的動作序列

(參考附錄：錯誤和得分的例子)

✎ ***「現在仔細看我的手指，然後模仿我手指的動作。請你等我完成動作後再開始模仿。首先，是這個手勢……」*** 展示手勢兩秒，然後告訴受測者 ***「現在輪到你做了。」***
-確認受測者在你*完成示範之後才開始*做動作。
-若受測者的手勢不正確或不精確，重復示範手勢一次(只重復*一次*)。
🕒 -每個題目*最多*15 秒。

重要！使用你的*右手*示范手勢，受測者則應該使用他/她的*左手*

手指	得分	備注
1. 	❑ 3 分 (在第一次示範後，就正確無誤地做出動作) ❑ 2 分 (在第二次示範後，就正確無誤地做出動作) ❑ 1 分 (在第二次示範後，只有*一個錯誤*–'錯誤'的標準見註解*) ❑ 0 分 (第二次示範後, 仍有多於一個錯誤、沒有作出任何反應、或是有連續性行為)	
2. 	❑ 3 分 (在第一次示範後，就正確無誤地做出動作) ❑ 2 分 (在第二次示範後，就正確無誤地做出動作) ❑ 1 分 (在第二次示範後，只有*一個錯誤*–'錯誤'的標準見註解*) ❑ 0 分 (第二次示範後, 仍有多於一個錯誤、沒有作出任何反應、或是有連續性行為)	
總分:	**/6**	

*1 分：(在第二次嘗試時) *只出現*以下錯誤之一:
- 手指姿勢正確但是手掌位置不正確

施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
使用的手	❑ 左手 ❑ 右手
總分 (把手部和手指兩部分的分數加起來)	_____/12

17. 任務回想 – 延遲再認

測驗手冊第 140-150 頁。

「現在有一些問題是關於今天我們做過的事情。」

-展示*並且*大聲地念出每個問題，並念出每個問題的四個選項。

-每個題目*最多*15 秒。

再認	選擇題	備注
1. "我剛才給你看的東西是甚麼？"	❑ **1** ❑ 2 ❑ 3 ❑ 4	
2. "你剛才要念的是甚麼？"	❑ 1 ❑ 2 ❑ **3** ❑ 4	
3. "你剛才需要記住甚麼？"	❑ 1 ❑ **2** ❑ 3 ❑ 4	
4. "哪一個東西是你剛才命名過的？"	❑ 1 ❑ **2** ❑ 3 ❑ 4	
5. 我剛才要求你做甚麼？ 念選項時*要同時做動作*： (1) 水平移動一隻舉起食指的手(☝↔) (2) 一隻手升起兩根手指(✌) (3) 打響指 (4) 把雙手放在做視覺消逝測驗時的相同位置	❑ 1 ❑ 2 ❑ 3 ❑ **4**	
6. "我剛才要你聽錄音裡的是甚麼？"	❑ **1** ❑ 2 ❑ 3 ❑ 4	
7. "你剛才要劃掉甚麼東西？"	❑ 1 ❑ 2 ❑ 3 ❑ **4**	
8. "我剛才要你使用甚麼物體？"	❑ 1 ❑ 2 ❑ **3** ❑ 4	
9. "哪張圖是剛才你需要為它造句子的？"	❑ 1 ❑ **2** ❑ 3 ❑ 4	
10. "我剛才要你做哪一個手勢？"	❑ 1 ❑ 2 ❑ 3 ❑ **4**	

施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
總分（在受測者曾參加所有測驗的情況下） 注：如果不是所有測驗都呈現，這一格填 NA	_____/**10**
更改後總分（如果受測者沒有參加其中一些測驗) 注：如果所有測驗都曾呈現，這一格填 NA	____/_____

18. **數字/價錢/時間閱讀**

測驗手冊第 151-154 頁。

「我會給你看一些數字、價錢和時間，請你把它們讀出來。」

-如果受測者將 539 念成「5-3-9」，而不是正確回應 「五百三十九」，跟他說: ***「你可以將它閱讀成一個整數嗎，就好像你在報告一個房間裡的人數？」***

-一個題目*最多*15 秒。

-若最前面三個題目*全部沒有回應*，則*停止*此部份的測試。

數字	**回應**
1. 539	
2. 2,304	
3. 17,290	

得分（正確回應): **/3**

「現在我會給你看一些價錢，請你把它們讀出來。」

- 在第一題，如果受測者未有說「元／蚊 」，跟他說: ***「你可以再次讀出這個價格一次，並明確表示這是一個價格嗎？」***

價錢	**回應**
1. $3.99	
2. $109.50	
3. $724.89	

得分（正確回應): **/3**

「現在我會給你看一些時間，請你把它們讀出來。」

時間*	**回應**
1. 9:30	
2. 2:45	
3. 6:10	

得分（正確回應): **/3**

* 可以接受完整或相對的時間說明（例：九點三十 和 九點半 兩者皆可）

施測情況 _____

(1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)

正確回應的數目 _____/9

注：如因最前面 3 個數字都沒有回應而停止測驗, 得分=0/9

19.**數字書寫**

受測者手冊

「我會讀一些數字，請你把它們寫下來。」 在受測者默寫的時候，有系統地復誦數字一次。

-每個題目*最多*15 秒。

-若最前面 2 個全部*沒有回應*，就*停止*此部份之測試。

數字	**回應**
1 927	
2. 12,500	

「現在,我會讀一些價錢，請你把它們寫下來。」

- 如果受測者未有寫 "$"符號, 跟他說 ***「你能不能請再次寫這個價格一次, 並明確表示這是一個價格嗎？」***

價錢	
3. $5.99	
4. $25.50	
5. $329.89	

施測情況 (1=**正常**; **沒有或停止測試**, **由於**：2=**失語症**; 3=**視覺空間障礙**; 4=**意識模糊**; 5=**疲勞**; 6=**肢體活動障礙**；7=**不識字**；8=**其他**: _____)	_____
正確回應的數目 **注**：**如因最前面 2 個題目都沒有回應而停止測驗**, **得分**=0/5	_____/5

20. **計算**

測驗手冊第 155-159、受測者手冊。

「我會請你做一些算數問題，你可以在這一頁上做計算或者寫出答案(同時從受測者手冊拿出相關的頁數)。(算數問題)**...** ***是多少？」***

-展示並且大聲念出每道題目。

-每個題目*最多*30 秒。

-如果受測者口語表達不可靠，要求他們寫下答案。

	回應
1. 15 + 38 = (53)	
2. 45 – 7 = (38)	
3. 8 x 6 = (48)	
4. 63 ÷ 7 = (9)	

如果受測者以書面回應而非口述答案,請注明: _____

施測情況 (1=**正常**; **沒有或停止測試**, **由於**：2=**失語症**; 3=**視覺空間障礙**; 4=**意識模糊**; 5=**疲勞**; 6=**肢體活動障礙**；7=**不識字**；8=**其他**: _____)	_____
回應模式	❑口述 ❑書面
正確回應的數目	_____/4

21. 文字默寫

受測者手冊

「我會給你說一些字，請你盡量把他們寫出來。」

-若最初三個題目*沒有回應*，就*停止*此部份測試。

	回應
1. 眼睛的「眼」	
2. 姐妹的「姐」	
3. 波浪的「波」	
4. 指揮的「指」	
5. 雖然的「雖」	
6. 座位的「座」	
7. 網球的「網」或 漁網的「網」	
8. 動物的「物」或 物體的「物」	
9. 城市的「城」	
10. 製造的「製」	
11. 授權的「授」或 傳授的「授」	
12. 替換的「換」或 換衣服的「換」	
13. 停止的「停」或 暫停的「停」	

施測情況 _____

(1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)

正確回應的數目 _____/4

注：如因最前面 3 個題目都沒有回應而停止測驗，得分=0/4

22. **複雜圖形的臨摹**

受測者手冊，計時器。

-在念指導語的時候把圖畫藏起來。

「我會給你看一張圖畫，請盡量原圖畫出來。」

-讓受測者看圖案，並記錄時間。

-本部分*最多用時*5 分鐘。

		得分
1. 中間的正方形	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確
2. 中間的箭頭	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
3. 中間右邊的曲線	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
4. 中間左邊的曲線	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
5. 中間的十字形	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
6. 中間主要的對角斜線	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
7. 對角線左邊的終點 (3 條線)	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
8. 左邊的長方形	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
9. 左邊的水平線條	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
10. 左邊的雙斜線 (平行)	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
11. 左邊的圓	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
12. 對角線右邊的終點 (1 條曲線)	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
13. 右邊的長方形	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
14. 右邊的水平線條	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確

15. 右邊的雙斜線（三角形狀）	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確
16. 右邊的兩個點	是否出現?	❑ 有 ❑ 沒有
	形狀/比例	❑正確 ❑ 不正確❑正確
	位置	❑ 不正確

注：計算錯誤時，盡量避免將同一處的錯誤計算在兩項中

施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
總分 (每一個"有"或"正確"都給 1 分)	_____/47
「中間」的總分	_____/17
「左邊」的總分	_____/15
「右邊」的總分	_____/15

如以下情況出現在被試的(臨摹)圖畫中，請在適當空格畫勾:

❑過份貼近行為 (Closing-in Behaviour): 圖畫非常接近原圖或覆蓋在原圖上面

❑寫字過小症 (Micrographia): 圖畫的高度及寬度皆小於原圖一半

❑寫字過大症 (Macrographia): 圖畫的高度及寬度皆大於原圖 1.5 倍

❑ (視覺/空間) 忽視 (Neglect): 因遺漏，左面或右面的表現相比另一側顯著遜色

❑自行添加 (Additions) /持續重復 (Perseverations): 圖畫包含在原圖中不存在的元素

23. 指導語的理解

評估受測者理解指導語的整體程度。

施測情況 (1=正常; 沒有或停止測試， 由於：2=失語症; 3=視覺空間障礙; 4=意識模糊; 5=疲勞; 6=肢體活動障礙；7=不識字；8=其他: _____)	_____
總分 **受測者對題目的理解程度** (1= 在施測者重復過問題後依舊不太瞭解；2=在施測者重復問題後，通常會有較好的理解；3K 理解力高，幾乎不太需要重復問題) 注：評估應主要基於對下列作業指導語/問題的理解： 預備測試(1a-1b-1c)，句子建構(3)，伯明翰前額葉測驗(10)和聽覺注意(11)	

Appendix B

Cultural and Linguistic Modifications for the HK-BCoS

Sections in HK-BCoS	**Number of items**	**Modifications specific for the Cantonese version**
1a) Orientation – Personal Information	8	1. The question 'What is your first name?' was modified to 'What is your name?'. 2. For the question 'What is/was your education', the options 'Primary school', 'Secondary school', 'College', 'Non-university diploma' and 'University diploma' were replaced by 'Not educated', 'Primary school', 'Junior secondary school', 'Senior secondary school' and 'University or above'.
1b) Orientation – Time and Space	6	1. The term 'city' was substituted by 'district' in Hong Kong and the multiple choice options 'Birmingham', 'Manchester', 'London' and 'Liverpool' was substituted by 'Kowloon', 'Hong Kong Island', 'New Territories' and 'Island'. 2. For the question 'Where are you?', the multiple choice item 'church' was substituted by 'home'.
1c) Orientation – Nosognosia	3	
2) Picture Naming	21	1. The items 'raspberry', 'colander', 'chisel' and 'stopwatch' were substituted by the items 'strawberry', 'kettle', 'screwdriver' and 'alarm clock'. 2. The items 'pear', 'spatula', 'onion', 'saw', 'lotus root', 'hammer' and 'pumpkin' were added.
3) Sentence Construction	2	
4) Sentence Reading	3	1. The two English sentences were replaced by three Chinese sentences.
5) Nonword Reading	6	1. The English nonwords were not adopted since there are no equivalent nonwords for Chinese. Therefore, the six nonwords were substituted by six pairs of two to three real Chinese characters, which contain no meaning when they are combined.
6) Story Recall and Recognition – Immediate Recall	15	1. The story was translated into Cantonese but the settings were modified to resemble the environment of Hong Kong.
7) Apple Cancellation	50	

8) Visual Extinction	24	
9) Tactile Extinction	24	
10) Rule Finding and Concept Switching Test	18	
11) Auditory Attention	54	
12) Story Recall and Recognition – Delayed Recall	15	
13) Multi-Step Object Use	1	
14) Gesture Production	10	1. The item ‘hitch-hiking’ was deleted. 2. The items ‘walking’, ‘money’ and ‘victory’ were added. 3. The item ‘salt cellar’ was substituted by ‘pepper cellar’ 4. The items ‘iron’ and ‘backscratcher’ were added.
15) Gesture Recognition	6	1. The item ‘cup’ was substituted by ‘comb’.
16) Meaningless Gesture Imitation	4	
17) Task Recall	10	
18) Number/ Price/ Time Reading	9	1. The pound sign ‘£’ was substituted by the dollar sign ‘$’.
19) Number Writing	5	1. The item ‘807’ was substituted by ‘927’.
20) Calculation	4	
21) Word Writing	13	1. Writing of nonwords was excluded. The four English real words were replaced by thirteen Chinese characters.
22) Complex Figure Copy	47	
23) Instruction Comprehension	1	