Part I. Question 1 to 10, please choose the answer closest to the underlined word or phrase. One Answer Only. 2 points each.

1. Leaders of the world's largest economies are close to an agreement to **tackle** the global financial crisis.
(A)fight　(B) meditate　(C) forbid　(D) deal with

2. I think people realize the economy seemingly **fell off the cliff.**
(A) inclined　(B) caught up　(C) help up　(D) slumped

3. In the future, globalization is going to be increasingly **driven** quickly to its processes and technologies, and start to march forward.
(A) directed　(B)motivated　(C) forced　(D) manipulated

4. The home team **kicked off** the season with an easy win.
(A) interrupted　(B) commenced　(C) avoided　(D) complicated

5. The use of stem cells is controversial - **opponents** object on the grounds that it is unethical to destroy embryos in the name of science.
(A) adversaries　(B) allies　(C) forerunners　(D) associates

6. Slumdog Millionaire is about a Mumbai **teen** who grew up in the slums, becomes a contestant on the Indian version of "Who Wants To Be A Millionaire?"
(A) asylum seeker　(B) gangster　C) youngster　(D) homeless

7. Critical listening is a difficult kind of listening because it requires you to both **interpret** and evaluate the message.
(A) understand　(B) integrate　C) intrigue　(D) compose

8. He is worried about a **potential** quiz tomorrow.
(A) possible　B) actual　(C) providential　(D) surprising

9. These two girls prefer to have **intimate** conversation one-on-one
(A) personal　(B) secret　(C) intelligent　(D) discreet

10. His position was **contrary** to that of the teacher's
(A) puzzling　(B) opposite　(C) compatible　(D) foreseeable

Part II. Question 11-15, please choose the answer that best completes the sentence. Question 16-20, please choose the best answer to fill each of the numbered blanks in the passage.

In many countries, it is considered ___11___ to appear naked or even half-naked on a public beach. However, some places often have a few ___12___ beaches that are designated as nudist or "clothing optional" beaches, where uninhibited people can fully ___13___ themselves to the sun. Other countries, especially those where ___14___ are hot and attitudes are ___15___, impose no restrictions at all, so people may sunbathe topless or nude even on the public beaches.

11. (A) inappropriate　(B) interesting　(C) conservative　(D) considerate
12. (A) inclusive　(B) executive　(C) secluded　(D) acceptable
13. (A) demonstrate　(B) expose　(C) lie down　(D) externalize
14. (A) seawater　(B) cuisine　(C) fashion　(D) climates
15. (A) strict　(B) sincere　(C) liberal　(D) general

There are many different forms of potential economic stimulus and they work in different ways. Tax cuts for individuals generally encourage short-term spending. Tax cuts for companies encourage both spending and investment. Expenditures on public works create contracts for firms and provide short- to medium-term ___16___. Investments in research and development take a longer-term approach ___17___ the theory ___18___ in the future (and thus provide jobs) if they have the money to make intelligent investments in their operations

1

now. Finally, some forms of economic stimulus seek to make investments that will pay off in the long run ___19___ for everybody. An example is investing in the U.S. energy grid. ___20___, a one-time outlay could make energy costs for both individuals and businesses less expensive for decades to come.

16. (A) opportunities of employment　　(B) employment opportunities
　　(C) employing opportunities　　(D) employment in opportunities

17. (A) under　　(B) in　　(C) of　　(D) on

18. (A) business is going to be thrive　　(B) which business is going to be thrive
　　(C) that business will thrive　　(D) business thrives

19. (A) with cheaper consumption　　(B) in making cheaper consumption
　　(C) by consuming cheaply　　(D) by making consumption cheaper

20. (A) Theoretic concern　　(B) Theoretical　　(C) Being theoretic　　(D) Theoretically

Part III. Reading Comprehension. In this part, you will read several passages. Each one is followed by one question or a number of questions. Question 21 – 40, you should choose the ONE best answer to each question. 2 points Each.

Question 21-25

The importance of strength in many sports is undeniable. It is so important that many university and professional teams now hire a specialized coach who only attends to the development of strength in athletes. It is interesting to note that no such specialist is hired to attend to the other components of physical fitness. We have yet to see a cardiovascular coach, a coach who attends to developing fitness of the heart and blood vessels, hired by universities or professional teams. This situation raises the question of the relative importance of each of these two components, strength training and cardiovascular training, to the other. Does the strength coach develop the cardiovascular system by prescribing a program to increase muscle fiber?

It is theoretically possible to design a weight-lifting program in which the resistance is so low and the repetitions so numerous that it provides the cardiovascular benefits of a running program. Therefore, if you view weights as a way to overload muscles, you can imagine a continuum of programs that emphasize cardiovascular benefits on the one extreme and strength on the other. The practical truth of the matter is that most coaches are primarily concerned with pure strength. Therefore, the athlete has to work on the end of the weight-overload continuum that promotes little, if any, cardiovascular benefit. In fact, one study has found that a high-intensity strength program reduced mitochondrial density (density of the cellular structures that produce energy in the muscle fiber) per unit of muscle. The athletes increased muscle mass, so they did not eliminate mitochondria presumably, but the fact remains that the oxidative capacity, the ability to use oxygen in the synthesis of energy, was not promoted. Oxidative capacity would usually improve in programs that stress cardiovascular conditioning. Neither increased blood flow nor increased mitochondrial density (both indicators of oxygen extraction) occur with strength training.

Obviously, there is nothing wrong with training athletes to gain strength, but in most strength programs cardiovascular improvements are not made. Therefore, for athletes, who require both strength and cardiovascular conditioning, both components must be trained independently.

21. What is the main point of the passage?
(A) College and professional teams do not need specialized coaches.
(B) Strength training should be replaced by cardiovascular training.
(C) Cardiovascular training is more difficult than strength training.
(D) Athletes need both strength and cardiovascular training.

22. Under which of the following conditions can a weight-lifting program provide cardiovascular benefits?
(A) When the weights are very heavy
(B) When the weights are lifted very slowly
(C) When lifting a heavy weight overtires the muscles
(D) When light weights are lifted a large number of times

23. Why does the author mention running?
(A) To give an example of the benefits of strength training
(B) To demonstrate what a typical weight program includes
(C) To give an example of an activity that provides cardiovascular conditioning
(D) To demonstrate the importance of oxygen extraction

24. Which of the following is an important direct result of cardiovascular training?
(A) Improved oxidative capacity
(B) Increased muscle fiber
(C) Decreased mitochondrial density
(D) Increased body weight

25. Which of the following policies would the author be most likely to support?
(A) Sports teams should increase their strength-training programs.
(B) All athletes should be able to choose the kinds of training they prefer.
(C) Sports teams should provide improved cardiovascular training.
(D) All athletes should avoid strength training in order to avoid injury.

Question 26-31

It is in search of adequate food supplies that cetaceans, marine mammals such as whales and dolphins, travel the oceans. They live in a world that is largely hidden from humans. Yet their range is three times as large as ours, since oceans occupy about three-quarters of the Earth's surface. They travel through well-marked ocean zones, **each** with its own characteristic marine life. They glide through the water, periodically rising to the surface to breathe. The sea may be raging but cetaceans are untroubled by the greatest storms; indeed they are more at home in rough than in calm seas.

Indirectly, however, their life is greatly influenced by wind. The eastward rotation of the Earth produces the **prevailing** trade winds, blowing east to west at the equator. These winds drag the surface waters and all they contain in a westerly direction. Warmed by its passage through the tropics, the wind-driven water is deflected against the westward continents, turning southwest in the Southern Hemisphere and northwest in the Northern Hemisphere.

In the Southern Hemisphere, the warm flow of tropical water under the west-going equatorial trade wind produces a genial climate along the eastern shores of Australia, South America, and South Africa. But there is open ocean to the south. Here the current is driven eastward unimpeded by land before the almost incessant westerly gales of this zone. The huge mass of water moves fast, chilled by water from the Antarctic Region, but **laden** with masses of plankton.

This cold, swift current is **split** when it strikes the southwestern extremities of the three southern continents. The northern portion of this water is diverted by the southwest coast of South America to sweep northward toward the equator. Known as the Humboldt Current, this current is rich in plankton on which cetaceans feed. Part of this same cool eastward-flowing current, enriched with water from higher latitudes, is similarly diverted north along the southwest coast of South Africa. This is the Benguela Current, where many cetaceans come to feed.

26. The passage answers which of the following questions?
(A) What is the main difference between cetaceans and other marine life?

(B) How far do most cetaceans travel in a year?

(C) How often do cetaceans need to breathe?

(D) What winds and ocean currents affect cetaceans?

27. The word **each** in paragraph 1 refers to a

(A) cetacean　　(B) surface　　(C) range　　(D) zone

28. The word **prevailing** in the passage is closest in meaning to

(A) arctic　　(B) blowing　　(C) dominant　　(D) energetic

29. The word **laden** in paragraph 3 is closest in meaning to

(A) balanced　　(B) filled　　(C) touched　　(D) wrapped

30. The word **split** in paragraph 4 is closest in meaning to

(A) stopped　　(B) divided　　(C) opened　　(D) surrounded

31. What do paragraphs 3 and 4 primarily discuss?

(A) The water currents in the Southern Hemisphere

(B) The trade winds in the Southern Hemisphere

(C) The three continents in the Southern Hemisphere

(D) The large area of open ocean in the Southern Hemisphere

Question 32-36

Doris Lessing received her Nobel Prize in 2007. Her novel *The Golden Notebook* is considered a feminist classic by some scholars, but notably not by the author herself, who later wrote that its theme of mental breakdowns as a means of healing and freeing one's self from illusions had been overlooked by critics. She also regretted that critics failed to appreciate the exceptional structure of the novel. As she explains in *Walking in the Shade,* Lessing modeled Molly, to an extent, on her good friend Joan Rodker, the daughter of the author and publisher John Rodker.

Lessing does not like the idea of being pigeon-holed as a feminist author. When asked why, she replies:

What the feminists want of me is something they haven't examined because it comes from religion. They want me to bear witness. What they would really like me to say is, 'Ha, sisters, I stand with you side by side in your struggle toward the golden dawn where all those beastly men are no more.' Do they really want people to make oversimplified statements about men and women? In fact, they do. I've come with great regret to this conclusion.

　– Doris Lessing, The New York Times, 25 July, 1982[8]

32. Doris Lessing is a Nobel Prize winner in

(A) Feminism.　　(B) Literature.　　(C) Sociology.　　(D) Peace.

33. According to Doris, what feminists want from her is

(A) exceptional structure.　　　　(B) fighting against men.

(C) creative ideas about men and women.　　(D) healing power from battles between men and women.

34. Doris Lessing does not particularly like the idea of being **pigeon-holed** as a feminist; pigeon-holed here means

(A) categorized　　(B) wholesale　　(C) viewed　　(D) completed

35. Which of the following statements is **FALSE**?

(A) Critics often neglect the theme of mental breakdowns as a self-freeing power.

(B) She models a heroine on her friend in one of her books.

(C) Her book *The Golden Book* is particularly considered a feminist one by Lessing.

(D) Lessing thinks critics understand her work very well.

36. Generally speaking, Lessing's attitude towards being considered a feminist is

(A) accepting　　(B) disappointed　　(C) welcomed　　(D) patient

Question 37-40

In recent years, many Taiwanese have won awards at international film festivals. However, many theater owners don't consider even prize-winning Taiwanese films to have much commercial potential in their home market. Their viewpoint is generally confirmed by the largely empty seats at showings of locally produced movies. The market share for local films is only about two percent, while more than 95 percent of the market is taken by Hollywood blockbusters. The dominance of American-made films in Taiwan has continued for the pat ten years, but the government is proposing some solutions. It is hoped that some legal changes and few promotional projects will help Taiwan's struggling film industry.

One proposal is to give individuals or companies a tax deduction for money spent to produce a film. The idea is that the tax deduction would encourage investments in new films. There are also plans to provide financial support not only for film production, but also for marketing,

37. Which of the following could be a title for this passage?
(A) The international Movie Industry and Taiwanese Films
(B) Trends in Taiwanese Moviegoing Habits
(C) Prize-Winning Taiwanese Films
(D) A Helping Hand for the Taiwanese Film Industry
38. Which of the following statements is true about Taiwanese films in general?
(A) They have been commercially successful both locally and abroad.
(B) Most production of local films has been moved to Hollywood.
(C) They have won many international awards, but little response from local audiences.
(D) They have found little success anywhere in the world.
39. What does the passage imply is the main reason that Taiwanese films do not have a large local audience?
(A) Taiwanese audiences dislike prize-winning films, thinking them "arty."
(B) American films are superior in quality.
(C) The Taiwanese film industry is not supported well enough financially.
(D) Ticket prices for local films are too high.
40. How is the government attempting to help the local film industry?
(A) By limiting the number of foreign films that local theater owners can show.
(B) By encourage lower ticket prices for local films.
(C) By establishing schools for training local filmmaking talent.
(D) By helping to make creating and promoting local films more affordable.

Part IV. Essay.　20 points.

Do you think that technology alienate people from one another? Why or Why not? Please write a well-structured essay in 150 to 200 words discussing your opinions.

一、　職能治療師常需使用不同的臨床推理方式（clinical reasoning）來進行評估及介入，請敘述五種不同的臨床 推理方式，並舉例說明之。(25%)

二、　請敘述職能治療倫理（Occupational Therapy Ethics）中之（1）核心價值與態度（core values and attitudes），（2）原則（principles）。(10%)

三、　請敘述（1）ICIDH (International Classification of Impairments, Disabilities, and Handicaps)，（2）ICF (Internatio nal Classification of Functioning, Disability and Health)，（3）比較 ICIDH 和 ICF 之不同。（15%）

四、　請說明 Sensory Integration Theory 之：（1）神經生理學基礎（neurobiological-based concepts），（2）假說（assumptions and postulates），（3）感覺統合失常之類型（sensory integrative dysfunction）與其原因，（4）感覺統合應用之範圍及限制（25%）

五、　請詳細說明精神科職能治療師常用的五種參考架構（Frame of Reference）之（1）主要理論及內容，（2）評估方式及介入原則，（3）臨床應用之舉例。(25%)

Please answer the following questions in relation to the attached journal paper,
entitled "Neuropsychological impairment after hemorrhagic stroke in basal ganglia"

1. Short answer questions (20%)
   (1) In 1.2. Neuropsychological assessment, line 8, what does "a priori" mean?
   (2) In 1.4. Statistical analyses, why do we need to hold certain variables constant in the MANCOVA?
   (3) In Results section, 2.2. neuropsychological performances, How do we interpret "Cronbach's alpha"?
   (4) In Results section, 2.2. neuropsychological performances, How do we interpret z-score?
2. Please describe the research design in the study? (20%)
3. What are the major findings in the study? (20%)
4. What are the limitations of this study? (20%)
5. What are the clinical implications of this study? (20%)

Neuropsychological impairment after hemorrhagic stroke in basal ganglia
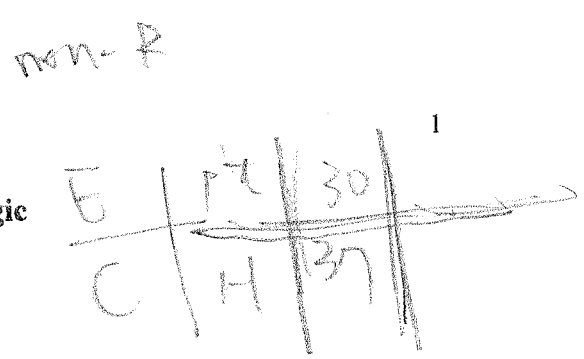
Abstract

We aimed to determine the severity and pattern of cognitive dysfunction in patients with basal ganglia (BG) hemorrhage within the first 6 months after stroke and to identify its clinical correlates. The study samples consisted of 30 patients with BG hemorrhage and 37 healthy controls. A comprehensive neuropsychological battery including tests of attention, memory, language, visuospatial function, and executive function was administered to all participants. Relative to healthy controls, BG patients performed significantly worse across different cognitive domains after controlling for age, sex, and education. 96.7% of patients displayed defective performance on at least three neuropsychological tests. Discriminant function analysis showed that visuospatial function and memory were the best predictors of group membership (patient/control), with an overall classification rate of 95.5%. Only side of stroke and admission Glasgow Coma Scale (GCS) score correlated significantly with some of the cognitive domains. The widespread pattern of cognitive deficits seen in BG patients provides evidence for the substantial involvement of the BG in many neuronal pathways connecting cortical and subcortical brain areas responsible for various cognitive functions.

1. Method

1.1. Participants

A total of 312 stroke patients with ICH were admitted consecutively to our Department of Neurosurgery between August 1999 and July 2000. Of these, 127 were diagnosed with BG hemorrhage. Patients were eligible if they were between 18 and 80 years of age, had a first-ever unilateral ICH that originated in the putamen, were between 1 and 6 months post-ictus, were medically stable, and consented to

participate in the study. ICH was defined as "nontraumatic abrupt onset of severe headache, altered level of consciousness, or focal neurologic deficit that is associated with a focal collection of blood within the brain parenchyma, as observed on computed tomography (CT) or during autopsy, and is not caused by hemorrhagic conversion of a cerebral infarction" (Woo et al., 2002). Exclusion criteria consisted of (1) hematoma secondary to head injury, congenital or acquired coagulation abnormalities, or any secondary cause of hemorrhage requiring surgical treatment such as cerebral aneurysm, arteriovenous malformation, or tumor, (2) history of Parkinson's disease, alcohol abuse, dementia, or psychiatric illness that might compromise cognitive functioning, (3) presence of severe unilateral neglect as measured by the Schenkenburg Line Bisection Test (Schenkenberg, Bradford, & Ajax, 1980) or serious communication difficulties that might adversely affect the validity of neuropsychological test results, and (4) unavailability for neuropsychological testing at 1–6 months following stroke owing to various reasons. Due to the lack of normative data appropriate for use with our patient sample for several neuropsychological tests or subtests, 37 healthy control subjects screened by interview for the absence of neurological and psychiatric disorders were recruited from the community via advertisements. This study was approved by the hospital's institutional review board, and in all cases, written informed consents were obtained from all participants.

1.2. Neuropsychological assessment

At entry to the study, participants were given an extensive battery of neuropsychological tests designed to cover a broad range of cognitive functions. Only standardized tests commonly used in clinical practice were applied. On the basis of neuropsychological theoretical framework (Lezak, 1995), we classified selective measures a priori to represent five cognitive domains: attention, memory, visuospatial function, language, and executive function. Attention was evaluated with the Digit Span (recall a string of random digits in the forward and reverse orders) and Visual Memory Span (reproduce forward or backward an invisible route of dots that the examiner had passed through) subtests from the Wechsler Memory Scale-Revised (WMS-R) (Wechsler, 1987), and serial-seven subtractions (count backwards from 100 decreasing by 7 each time) item of the Mini-Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975). Visuospatial function was assessed with the Block Design (use blocks to recreate the design according to a pattern in a Stimulus Book) subtest from the Wechsler Adult Intelligence Scale-Revised (WAIS-R) (Wechsler, 1981), Hooper Visual Organization Test (mentally rotate depicted pieces of drawings to be able to recognize the complete drawing) (HVOT) (Hooper, 1983), and Spatial Relationships (identify one of the five visual forms that is facing the wrong way) and Form Constancy (recognize the same form when it varies in size from the stimulus) subtests from the Test of Visual-Perceptual Skills (TVPS) (Gardner, 1982). Memory was evaluated with the orientation to time and place (present date and where the testing takes place) items of the MMSE (Folstein et al.), a 15-s delayed recall, Form D of the Benton Visual Retention Test (draw the design that consists of one or more geometric figures from memory after a delay of 15 s) (BVRT)

(Benton, 1992), and Verbal Memory Scale (repeat as many of the words, sentences, and a short story as remembered that were presented with and without interference) from the Chinese version of the Luria-Nebraska Neuropsychological Battery (LNNB) (Golden, Hammeke, & Purisch, 1980). Language was evaluated with the Receptive Speech (repeat phonemes, define simple words, and answer statements made up of complex grammatical and inverted speech structures) and Expressive Speech (articulate speech sounds and words, name objects, and generate complex speech) Scales of the Chinese version of the LNNB (Golden et al.). Executive functions were assessed with the first deck of 64 cards from the Wisconsin Card Sorting Test (match each of the cards in the deck to one of the four key cards and give feedback each time whether the match is right or wrong) (WCST) (Heaton, Chelune, & Talley, 1993). In addition, the MMSE was administered to all subjects to determine the level of general cognitive function.

1.3. Procedure

Information regarding CT or magnetic resonance imaging (MRI) result, diagnosis, stroke lateralization, date of stroke onset, hemorrhages with rupture into the ventricular system, Glasgow Coma Scale (GCS) score on admission, craniotomy, medical and psychological conditions, age, and highest level of educational achievement were gathered from patients' medical records. In all patients, CT scans or MRI were performed within 48 h after the onset of stroke. These neuroimaging films were read independently and blindly by hospital neuroradiologists, irrespective of whether the patient was included in the present sample. The patient's attending neurosurgeon confirmed the diagnosis of basal ganglia hemorrhage based on brain imaging. Patients were evaluated by three occupational therapists with at least 3 years of clinical experience in stroke rehabilitation. Healthy controls were assessed by two graduate research assistants majoring in clinical psychology. These examiners were required to undertake an intensive training provided by the principal investigator in the administration and scoring of the neuropsychological tests employed in the current study. After completing the training, which involved lecture, demonstration, and hands-on practice, one of the examiners administered the tests to a stroke patient with the other four examiners recording and scoring the responses. Inter-rater reliabilities were very high (>0.97) for all tests, indicating a high degree of consistency among five examiners. During formal testing, examiners administered and scored the tests in accordance with the standardized procedures as outlined in the test manuals, except for language and memory subscales of the LNNB. In the standard scoring scheme for these test measures, high scores indicate poor performance. However, in the interests of consistency and ease of interpretation, the scoring of the LNNB language and memory subscales was reversed such that higher scores represented better performance. Besides, given the large number of WCST scores and the small number of study subjects, only four WCST indices, which were consistently found to load on the same factor in the prior factor analytic studies and thus labeled "overall conceptualization/perseveration" (Greve, Ingram, & Bianchini, 1998), were included in the analyses: perseverative errors, conceptual level responses, number of categories completed, and total correct. All participants were typically evaluated in a single session, which lasted 3 or 4 h, and were given breaks where appropriate to minimize the effects of fatigue on performance.

1.4. Statistical analyses

Exploratory data analysis was first carried out to determine the score distribution of 17 neuropsychological tasks in the entire sample ($n = 67$). Knowing the symmetry of the underlying data was important for parametric analysis, or doing transformations to the data. Average skewness of all tests was -0.35, indicating that our data set approximated normal distribution. Next, confirmatory factor analysis (CFA) was performed to verify the construct of each of the five major cognitive dimensions specified in an a priori manner by means of version 5.0 of the Analysis of Moment Structures (AMOS) software (Arbuckle & Wothke, 2003). The measurement model of each cognitive dimension was conceptualized as a one-factor model with its respective indictors (set of items or subtests) loading on one factor and errors of all indicators independent. Based on the recommendation of Hu and Bentler (1999), the non-normed fit index (NNFI), root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR) were employed to determine the goodness-of-fit of the data to the proposed one-factor model. These three fit indices are relatively independent of the sample size compared with other common indices. The cut-off values used to assess the adequacy of model fit was determined in accordance with the literature as follows: NNFI > 0.9; RMSEA < 0.08; SRMR < 0.08 (Hu and Bentler). **(MANCOVA) was conducted to test for an overall group effect (patients versus healthy controls) on five neuropsychological domain-specific factor scores, with age, gender, and education included as covariates. Thus, the differential effects of age, gender, and education were kept constant.** To explore how far and in what direction, the patient's test performance deviated from that of healthy controls, z-score was calculated for each cognitive domain (i.e., (patient's mean factor score−control mean factor score)/control S.D.) and test (i.e., (patient's mean test score−control mean test score)/control S.D.). The criterion used to determine cognitive impairment was a z-score of 2 S.D. or more below the control mean. Since group mean may hide the distribution of test scores within a group, the percentage of BG patients was calculated whose score on a cognitive domain fell below the criterion for significant impairment. Discriminant function analysis was conducted to identify the principal cognitive domains to discriminate the two groups. Finally, the Pearson correlations were calculated to determine relationships between cognitive domain scores, GCS score, and time interval between stroke onset and cognitive testing, whereas point–biserial correlations were performed to investigate the associations between cognitive domain scores, lesion side, intraventricular hemorrhage, and craniotomy.

2. Results

2.1. Subject characteristics

During the duration of recruitment, 127 BG patients were screened for suitability and 30 who met inclusion and exclusion criteria entered into the study. The reasons for exclusion are summarized as follows: deceased 15, >80 years 9, refusal 18, disturbed consciousness 9, recurrent stroke 14, lost contact 18, unable to communicate or comprehend test instructions 11, severe unilateral neglect 3. Table 1 displays characteristics of study participants. The mean MMSE score (maximum 30) was 19.9 in patient group and 28 in healthy control group. Hematoma was found to be restricted to the putamen in 83% of the patients, while rupture of the hematoma into the ventricular system was found in 17% of patients who had a radiological finding of a putaminal hematoma that extended to the head of the caudate nucleus and lateral ventricle. Seventy percent of the patients had cerebral lesions in the right hemisphere.

The mean time between stroke onset and cognitive testing was 97 days. Admission GCS score ranged from 7 to 15. Fifty-seven percent of the patients underwent craniotomy due to increased intracranial pressure, which resulted in herniation. The patient and control groups were comparable with regard to age and years of education, but differed significantly in sex distribution and MMSE total score. The proportion of women was higher in the control group than in the patient group.

2.2. Neuropsychological performances

CFA was undertaken within each of the five cognitive domains for the entire sample to ascertain that the hypothesized one-factor model corresponded to each domain. Goodness-of-fit information is listed in Table 2. The default models for all cognitive domains were found to have good fit to the data, as all of the fit indices satisfied the above-stated standards for goodness-of-fit. All domains showed moderate to good internal consistency, with **Cronbach's alpha** ranging from 0.76 to 0.90. Taken together, these results lent support to the specific cognitive function (defined theoretically) each domain is supposed to measure, based on which factor scores could be calculated reliably to represent a composite score for each cognitive domain. Results from the one-way MANCOVA revealed a significant main effect for group (Wilks' _ = 0.30, $F_{5,58} = 27.03$, $p < 0.001$), but nonsignificant effects for age (Wilks' _ = 0.90, $F_{5,58} = 1.28$, $p = 0.29$), gender (Wilks' _ = 0.94, $F_{5,58} = 0.69$, $p = 0.63$), and education (Wilks' _ = 0.88, $F_{5,59} = 1.66$, $p = 0.16$). Subsequently, the MANCOVA was followed by five univariate ANCOVAs. Because of the number of comparisons, the Bonferroni adjustment was used (i.e., p-values were set at 0.01 or 0.05/5). Significant between-group differences were found in attention ($F_{1,62} = 35.85$, $p < 0.001$, partial $\eta^2 = 0.37$), memory ($F_{1,62} = 49.75$, $p < 0.001$, partial $\eta^2 = 0.45$), language ($F_{1,62} = 23.78$, $p < 0.001$, partial $\eta^2 = 0.28$), visuospatial function ($F_{1,62} = 109.13$, $p < 0.001$, partial $\eta^2 = 0.64$), and executive function ($F_{1,62} = 32.84$, $p < 0.001$, partial $\eta^2 = 0.35$) domains. Partial η^2 refers to the proportion of total variability attributable to a variable (Keppel, 1991). Apparently, visuospatial function and memory domains had the largest effect sizes. Table 3 shows mean z-scores and frequency of cognitive impairment for the five domains. As can be seen, impairments were present in all cognitive domains that were ranked in descending order by magnitude of mean z-scores as follows: executive function, visuospatial function, memory, language, and attention. The frequency of cognitive impairment, which was determined by the proportion of patients falling in the designated range, was 60% and above across domains. The domains with the greatest rate of significant impairment were visuospatial function and memory. Distribution of z-values along with 95% confidence intervals across cognitive domains is depicted in Fig. 1. In regard to computation of the percentage of patients demonstrating impairment on the cognitive tests, a total of 14 tests were examined with the exclusion of three WCST scores (i.e., conceptual level responses, number of categories completed, and total correct). These three scores were not included because they were moderately correlated with perseverative errors, with significant correlation coefficients ranging between −0.58 and −0.69, which may result in overestimation of cognitive impairment. As is apparent from Table 4, regardless of MMSE scores, 29 (96.7%) BG patients exhibited impaired performance (2 S.D. below the mean) on at least three cognitive tests. When taking MMSE score into consideration, the majority (90.4%) of patients whose MMSE scores <24 had impairment clustered between six and seven cognitive tests, whereas 11–22% of patients whose MMSE scores >23 displayed impairment between

two and seven cognitive tests. In comparison, none of the controls showed impairment in three or more tests. To identify cognitive domains that differentiated groups, domain-specific factor scores were entered into the analysis. Wilks' test was significant ($\_$ = 0.21, $\_2$ = 96.31, df=5, p < 0.001). Cognitive test predictors, on the whole, were able to discriminate patients from controls with 95.5% accuracy. Group membership was correctly predicted for 90 and 100% of the patients and healthy controls, respectively. Visuospatial function was the best discriminator between the groups (standardized discriminant coefficients = 0.76), followed by memory (0.56), attention (−0.29), executive function (0.26), and language (0.04). Among BG patients, side of stroke correlated mildly to moderately with all domains except for attention and memory, while mild correlation emerged between admission GCS score and executive function domain (Table 5). Specifically, independent samples t-tests showed that patients with right BG stroke performed inferior to those with left BG stroke on visuospatial (t =−2.70, p = 0.02) and executive function (t =−2.86, p = 0.008) domains, whereas patients with left BG stroke performed poorer than those with right BG stroke on language (t = 2.45, p = 0.02) and memory (t = 2.06, p = 0.04) domains. No correlation of the cognitive domains with interval between onset and cognitive testing, intraventricular hemorrhage, and craniotomy achieved significance level. Intercorrelations among cognitive dimensions showed that attention was moderately to highly correlated with all but executive function domain (Table 6). As anticipated, a high correlation was observed between language and memory domains as three of the four memory tasks had a verbal referent. However, no significant correspondence existed between language, memory, visuospatial, and executive function domains. Visuospatial functionwas moderately correlated with executive function.

Table 1

Demographic and clinical characteristics of study participants

Characteristics	BG patients (N = 30)			Healthy controls (N = 37)			p
	Mean	S.D.	Range	Mean	S.D.	Range	
Age (yrs)	53.8	8.3	40-71	56.9	5.0	50-66	0.08[a]
Education (yrs)	8.0	4.5	0-16	9.9	3.0	0-14	0.06[a]
Initial GCS score	12.0	2.8	7-15				
MMSE total score	19.9	6.1	8-30	28.03	1.5	24-30	0.00[a]
Onset-testing interval (days)	97.4	39.9	30-182				
	N	%		N	%		
Female	5	16.7		21	56.8		0.001[b]
Craniotomy	17	56.7					
Right hemisphere damage	21	70					
IVH	5	16.7					

Note. BG: basal ganglia. S.D.: standard deviation. MMSE: Mini-Mental State Examination; GCS: Glasgow coma scale. IVH: intraventricular hemorrhage.

[a] Independent samples t-test.

[b] Chi-square test.

Table 2

Goodness-of-fit indices and internal consistency for each cognitive domain ($N = 67$)

Neuropsychological domain	NNFI	SRMR	RMSEA	Cronbach's α
Attention	0.98	0.03	0.07	0.82
Memory	1.08	0.00	0.00	0.76
Language	1.03	0.01	0.00	0.90
Visuospatial function	1.02	0.01	0.00	0.77
Executive function	1.00	0.05	0.04	0.76

Note. NNFI: nonnormed fit index. RMSEA: root mean square error of approximation. SRMR: standardized root mean square residual.

Table 3

Mean z-scores for five cognitive domains for patients with basal ganglia hemorrhage

Cognitive domain	Z Scores			% ≥ 2 S.D.[a]
	Mean	S.D.	Range	
Attention	-2.51	1.7	-5.44 to 1.15	60
Memory	-3.27	1.7	-6.95 to 1.04	76.7
Language	-3.24	2.4	-9.06 to 0.40	63.3
Visuospatial function	-3.30	1.0	-4.52 to -1.06	80
Executive function	-4.25	3.5	-9.52 to 0.81	63.3

Note. BG: basal ganglia.

[a] Percentage of z-scores at least two standard deviations below the mean of the healthy control group.

Table 4

Frequency of impaired tests and percentages of patients with basal ganglia hemorrhage and healthy controls demonstrating impairments

No. of tests impaired[a]	BG patients, %			Healthy controls, % ($N = 37$)
	MMSE< 24 ($N = 21$)	MMSE>23 ($N = 9$)	Total ($N = 30$)	
0	0	0	0	70.3
1	0	0	0	21.6
2	0	11	3.3	8.1
3	9.5	11	10	0
4	0	22	6.7	0
5	0	22	6.7	0
6	19.0	11	13.0	0
≥7	71.4	22	60	0

Note. BG: basal ganglia.

[a] A test score was categorized as impaired if it was at least two standard deviations below the mean score of the healthy controls.

Table 5

Correlation matrix of neuropsychological performance and clinical severity in patients with basal ganglia hemorrhage

Neuropsychological domain	Lesion side[b]	GCS score[a]	Onset-testing interval[a]	IVH[b]	Craniotomy[b]
Attention	0.08	0.34	-0.05	-0.27	0.24
Visuospatial function	0.58**	0.29	-0.17	-0.05	0.27
Memory	-0.25	0.17	0.03	-0.14	0.10
Language	-0.36*	0.20	-0.21	-0.10	0.14
Executive function	0.47**	0.37*	-0.12	0.03	0.31

Note. GCS: Glasgow Coma Scale. IVH: intraventricular hemorrhage.

[a] Pearson correlation coefficients

[b] Point-biserial correlation coefficients

* $p < 0.05$.

** $p < 0.01$.

Table 6

Intercorrelations among cognitive domains in patients with basal ganglia hemorrhage

	Attention	Visuospatial function	Language	Memory
Attention	-			
Visuospatial function	0.61**	-		
Language	0.71**	0.27	-	
Memory	0.62**	0.34	0.70**	-
Executive function	0.20	0.54*	0.15	0.01

* $p < 0.01$.

** $p < 0.001$.

I. Explanation of the following research terminology: 40%
1. Sampling
2. Within-subjects design
3. Evidence-based practice
4. Translational research
5. Single-subject design

II. Answer the following question: 60%
1. Describe the types of measure scale in a quantitative research.
2. For the ethical issues in clinical research, please describe the informational elements and consent elements of informed consent
3. Describe the advantages and disadvantages of a quasi-experimental design
4. Describe the single group threats to the internal validity in a experimental design.