Research on the evaluation method of communication ability in business english teaching

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Abstract: According to the evaluation characteristics of business English language communication ability, a fuzzy principal component classification evaluation method for the elderly language communication ability is proposed. The main component analysis method is used to calculate the weight of each evaluation index, and the fuzzy comprehensive evaluation method is used to classify the comprehensive grade of language communication ability. The reliability of the evaluation method proposed in this paper is verified by using index data.

1. Introdution

The study of language and speech function detection in foreign countries started earlier. The International Classification of Function, Disability and Health, as a guiding assessment tool, was published by the World Health Organization in The 54th World Health Assembly, held on May 22, 2001, was formally adopted and promulgated. It is the first classification of shared functions, diseases and health signs, with international universality [1-2]. The assessment of language communication ability in ICF mainly involves mental function, sensory function, phonation and language function, and language communication activities in social participation[3-4]. The content is comprehensive and detailed, which is instructive. However, the content of the tool is too lengthy and tedious, and it is difficult for some people to complete the complete set of tests, and some technical tests are not applicable to some people. Peabody Pictures Vocabulary Test - Third Edition (Peabody Picture Vocabulary Test-Third Edition，PPVT-III), is an evaluation tool composed of a series of pictures, of which the difficulty increases in turn[5-6]. It is mainly used to test the cognitive and understanding level of the subject in the process of language ability, and is suitable for individuals of all ages under English audio-visual. PPVT - III has good reliability and validity, and the test takes a short time, usually within 15 minutes. However, there are some limitations. For some people with poor eyesight, their language communication ability cannot be accurately detected, and the language communication barriers caused by hearing and vision cannot be detected.

Due to different cultural backgrounds, foreign scales are not applicable to China[7-8]. Common language evaluation methods in China are: the Aphasia Battery of Chinese (ABC), which was developed in 1988 by Gao Surong, a neuropsychological research expert in the affiliated hospital of Beijing Medical University, and was applied to clinical practice[9-10]. The test is based on WAB and designed in combination with China's clinical experience. It sets unified standard indicators Text or picture cards and aphasia scoring and classification criteria. In terms of the evaluation content, we focus on common words and sentences. Considering the different cultural levels and regions, the detection sentences are mostly popular and simple. The clinical evaluation results show that the subjects with different education levels have completed more than 91% of listening and speaking comprehension, which can assess normal speech function or aphasia, and can also detect the impairment of other speech functions in patients with normal cerebrovascular language. Wang Xinde, Hou Surong, et al. of Beijing Hospital revised the Chinese Aphasia Examination of Beijing Hospital in 1994. The examination includes oral expression, listening comprehension, reading, writing, etc. It can quantitatively assess the type of aphasia and the dynamics of speech rehabilitation, and can be used to evaluate the rehabilitation effect. The Chinese Standard Aphasia Examination (CRRCSAE) method of China Rehabilitation Research Center refers to the SLTA of Japan in terms of concept and structural framework, and strictly follows the rules and habits of Chinese grammar in terms of sentence selection. The CRRCSAE method has comprehensive and perfect functions and is highly recognized in China. However, most of these domestic detection methods are simple scale detection, and lack of research combined with computer detection machine, that is, the objectivity is weak.

The detection process of language communication ability includes information received, brain response, and voice expression. The intelligibility, quality, and speed of voice are all important parts of language communication ability. The research of speech signal technology has made great progress at home and abroad.

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The research of Chinese speech synthesis started later in China than abroad, but with the strong support of the country, great progress has been made in formant synthesis, LPC linear prediction technology, etc., especially the application of PSOLA time domain waveform splicing technology to improve the effect of speech synthesis technology, which was developed by the Institute of Acoustics, Chinese Academy of Sciences in 1993 KX-PSOLA, TH developed by Tsinghua University_ SPEECH, KDTALK and other systems developed by the University of Science and Technology of China in 1995, all of which apply PSOLA to achieve ideal results in intelligibility and clarity of synthesized speech. However, the synthetic language is too mechanized, with poor fluency and naturalness.

2. Model selection analysis

By comparing the importance of the impact of risk indicators in pairs, the subordination judgment matrix [6] and the impact judgment matrix are respectively constructed using Satty1-9's 9-level scale value taking method, and the mixed matrix of the weight of the risk assessment indicators of leakage disaster is constructed, and the mixed matrix is normalized to obtain the weight value of each risk assessment indicator. The membership judgment matrix weight W (Rt) can be calculated by square root method. In addition, this paper proposes a matrix multiplication method to calculate the index weight generated by the interaction between indicators. Not only the direct influence between indicators is fully considered, but also the indirect influence between indicators can be quantified. The judgment matrix of influence action is established for the criterion layer corresponding to the index with direct influence action in pairs. Take the risk indicators in the criterion layer corresponding to the affected risk indicators as the judgment basis, compare the importance of the affected risk indicators and the affected risk indicators to the indicators in pairs, and use Satty1-9's 9-level scale value taking method to assign values. The judgment matrix of influence effect obtained is shown in formula (1):

$$A = \begin{bmatrix} 0 & 0 & \cdots & a_{1,2} \\ 0 & a_{3,1} & & 0 \\ \vdots & & \ddots & \vdots \\ 0 & 0 & \cdots & 0 \end{bmatrix} \quad (1)$$

Calculate the index weight matrix W (Rs Rt) of each influence judgment matrix, and the calculation method is shown in Formula (2):

$$W_{R_sR_t} = X_{R_sR_t} \cdot W_{R_t} \quad (2)$$

In the formula, W (Rs) is the weight matrix of Rs' membership judgment index, and X (Rs Rt) is the judgment matrix of Rs' influence on Rt. There is not only a direct impact relationship between indicators, but also an indirect impact relationship sometimes. If there are indicators in Rp that affect Rs, and there are indicators in Rs that affect Rt, it means that there are indicators in Rp that affect Rt to some extent.

$$W_{R_pR_t} = X_{R_pR_s} \cdot W_{R_sR_t} = X_{R_pR_s} \cdot X_{R_sR_t} \cdot W_{R_t} \quad (3)$$

By analogy, if there are multiple joint and several influences:

$$W_{R_qR_t} = X_{R_qR_{q+1}} \cdot X_{R_{q+1}R_{q+2}} \cdot \cdots \cdot X_{R_{t-1}R_t} W_{R_t} \quad (4)$$

Based on the membership judgment weight matrix and index weight matrix of each influence judgment matrix calculated above, a mixed matrix of evaluation index weights is constructed:

$$W = \begin{bmatrix} W_{R_1} & W_{R_1R_2} & W_{R_1R_3} & & W_{R_1R_t} \\ W_{R_2R_1} & W_{R_2} & W_{R_2R_3} & \cdots & W_{R_2R_t} \\ W_{R_3R_1} & W_{R_3R_2} & W_{R_3} & & W_{R_3R_t} \\ & \vdots & & \ddots & \vdots \\ W_{R_tR_1} & W_{R_tR_2} & W_{R_tR_3} & \cdots & W_{R_t} \end{bmatrix} \quad (5)$$

Based on the mixed matrix W of risk assessment index weights and the index weight matrix WM of the criteria layer, calculate the importance ranking weight WR of each index in the measure layer relative to the target layer. The calculation method is shown in Formula (6):

$$W_R = W_M \cdot W^T \quad (6)$$

Finally, the final index weight matrix can be obtained by normalizing the obtained index weight values.

3. Problem analysis

Sensation is the reflection of the human brain on the individual attributes of the objective things that directly affect the sensory organs. Perception is the overall reflection of the human brain on various individual attributes of the objective things currently acting on the sensory organs, and is the high-level activity of the cerebral cortex. Communication ability refers to the ability of individuals to effectively receive objective things, make overall reflection, and accurately express their thinking process and results orally or in writing. The results of expression include facts, feelings, value orientations, opinions, etc. Communication ability is mainly shown in two aspects. First, the ability to think about receiving useful information and making logical analysis and judgment. 2、 The ability level to accurately express the thinking process and results, that is, the intelligibility of the words expressed. We can know the attributes of things through feeling, and we can have a comprehensive impression of things through perception. Finally, we can accurately express the impression and understanding of things, so as to achieve communication and information exchange between people. Therefore, perception is based on feeling, but it is not a simple superposition of feelings, but the result of the analysis of various sensory stimuli and the integration of past experience and knowledge. Communication is the communication between two or more people's perception of things reflected in space and individuals. The structure and function of the brain play

a decisive role in sense, perception, communication and expression. According to the complexity of functional areas, different parts of the cerebral cortex are associated with different divisions of perception and communication. The cerebral cortex is divided into three functional level areas. The first cortex area includes Grade I sensory area, Grade I visual area, Grade I auditory area and Grade I motor area. These four areas or centers are the final projection areas of the specific sensory conduction bundle, which can cause and convey sensory information of a clear nature, such as hearing, vision, touch and feeling of motion. Cortex of the second joint area: there are visual joint area, auditory joint area and somatomotor joint area. They are not only connected with each other, but also with the first area and higher level. The joint area is interconnected, mainly for complex processing of information. The third joint area, also known as overlapping area, implements the integration of complex information involving multiple different cortical areas.

4. Problem analysis

Based on the construction method of the subordination judgment matrix and influence judgment matrix of the above evaluation indicators, a questionnaire was designed to compare the importance of the indicators in pairs. Five experts with rich experience in gas related work were invited to fill in the questionnaire, and the questionnaire scores of the five experts were summarized and averaged.

$$R = (0.067, 0.162, 0.205, 0.336, 0.207)$$

Through in-depth analysis of the evaluation results, we can know that language is a symbol system composed of certain rules for people to exchange ideas, feelings and needs, and is a tool for information exchange between people. Speech signals are transmitted and received in the form of sound waves, and the perception process of speech is generated.

The understanding and expression of language are mainly controlled by the speech function of the cerebral cortex. The neurophysiological basis of language controls the reception and understanding of auditory language (the connection between speech and semantics). It is located in the middle and lower part of the left hemisphere near the auditory cortex, called Wernicke region. The part mainly responsible for speech production and expression functions is located in the lower part of the left frontal lobe of the brain, which is called Broca area. The two areas are connected by "arcuate fiber bundles". When expressing, the discourse is first formed in Wernicke area, and then transmitted to Broca area by arcuate fiber bundles to form and vocalize decision words. Then, the generated instructions are received in the motor cortex area that dominates speech expression. The formation, transmission and reception of speech are shown at three levels. At the first level of speech science, all kinds of speech information to be expressed are arranged and combined with specified symbols in the cerebral cortex. The second level of physiology is to say words, sentences and articles according to the coordinated movement of articulation organs. Under the control of the brain and nerves, the speech muscles coordinate and move. After speaking, the speech is transmitted to the hearing center through the other party's hearing organ, and then transmitted to the speaking center in the same way to complete the command response. The third acoustic level is that the speaker forms words and sentences through the coordinated movement of speech muscles and transmits them through sound. Sound transmission includes three factors: sound intensity, pitch (pitch) and timbre. Communication and expression is the process of verbal transmission and response of information between two or more people. Oral expression is the main way of communication and expression of old language communication ability. It conveys your needs and ideas to others through words. The language communication between the two people forms a complete language communication chain.

Mental state usually refers to the active state of human consciousness, thinking and psychology. Consciousness or coma, confusion, depression, aggressive behavior and depression are all manifestations of mental state. The mental state is mainly related to the overall mental functions of the brain such as consciousness, energy and drive, special mental functions such as image, language and calculation, and special mental functions of the body controlling movement, mental activities and emotional attitudes. The special mental function of the frontal lobe of the brain mainly regulates various complex movements to generate ideas and plan movements, which is called executive function. The prefrontal cortex in the high-level joint cortex of the brain produces ideas, forms concepts, judges, abstract thinking, memory intelligence, emotion and other functions. The marginal joint cortex includes the frontal orbital, temporal frontal, cingulate gyrus, and parahippocampal gyrus structures, which mainly manage the motivation and emotional response of memory and behavior.

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5. Conclusions

This study proposes a fuzzy principal component classification method to evaluate the language communication ability of the elderly. The weight of each evaluation index is calculated by principal component analysis, and the comprehensive grade of language communication ability is classified by fuzzy comprehensive evaluation. The reliability of the evaluation method proposed in this paper is verified by index data.

References

1. Mo Lijuan, Fan Liping, Wu Yongzi, Li Fei, He Zhihua. The influence of shared decision-making intervention and multisensory training on language communication and hope level of laryngeal cancer patients undergoing surgery [J]. Nursing Practice and Research, 2022,19 (23): 3481-3485
2. Jinbo A Study on the Current Situation and Countermeasures of English Learning Anxiety of Senior Students in Rural Primary Schools [D]. Yanbian University, 2022
3. Yu Chongni Students' willingness to communicate in English in online college English classes [D]. Zhejiang University, 2021
4. Zhang Fang Research on the Current Situation and Countermeasures of Communication Intention in Secondary Vocational English Class [D]. Northwest Normal University, 2019
5. Zhang Xuelin Research on assessment methods of language communication ability of the elderly [D]. Hebei University of Technology, 2018
6. Zhao Tingting Research on the Influence of English Language Environment Contact on Junior Middle School Students' English Learning Interest [D]. Yunnan University, 2017
7. Feng Wenjing A Study on High School Students'Willingness to Communicate in English Class and Its Influencing Factors [D]. Xi'an Foreign Studies University, 2016
8. Zhao Ruqing Design and Development of College Students' English Interactive Communication Website [D]. Central China Normal University, 2015
9. Daihuili A Study on the Problems and Strategies of Students' Communication in College Public English Teaching [D]. Central China Normal University, 2014
10. Liu Ling A Survey on the Use of Postgraduates' Oral English Communication Strategies [D]. Taiyuan University of Technology, 2008