CHINESE CHARACTERS - A DIRECT LINK TO THOUGHT?

CHINESE LANGUAGE - A DIRECT LINK TO LOGIC?

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1. Introduction

Some form of Chinese is spoken as a first language by over a billion people in the world, and curiously, the rest either know little about this majority language, or harbour delightful or damaging delusions about the nature of it. Cantonese people always sound as if they're fighting, Chinese people are so polite, Chinese characters are so beautiful, Chinese has no grammar and so on and so on......

The aim of this paper is to look at some of the research which has investigated whether, and how, Chinese differs from other languages, particularly focusing on reading and writing. I will first take four examples of quite extreme theories, some based on empirical research, and mostly of a Whorfian outlook which exemplify the magic and myth approach. Modern research on Chinese educational achievement at first sight appears to be similarly extreme, and a brief discussion of this will be included, especially where it relates to remembering and memorising. I will then discuss a widespread, traditional view, amongst Chinese and Western scholars, that Chinese characters provide a direct link with thought and that Chinese writing (in the sense of text) is more logical than Western writing. This is followed by a brief review of recent empirical research which shows a more objective balanced view of the cognitive processes of Chinese language and finally, my own humble opinions on the matter. Naturally this is a mere scratch at the surface.

2. Some extreme theories of Chinese language and writing

2. 1 Bloom's theory of counterfactuals

Bloom's paper (1981) is well known to linguists. Bloom suggests that because Chinese does not use the equivalents of 'if', 'whether' etc., and does not have a subjunctive mood, Chinese speakers are less able to think in terms of counterfactuality. According to Bloom, they are anchored in the here and now and may not think in abstract terms. It is not difficult to fault Bloom's premises, or his experimental methods or his conclusions. Chinese does have equivalents of conditional connectives and it does have modal verbs. Bloom's experiments have been roundly criticised by many, for example Au (1992), who points out that the translations used by Bloom were faulty. Au suggests that some western research in Chinese thought and language is based either on complete ignorance, or on insufficient knowledge of the language.

2. 2 Rozin's cure for dyslexia

At the positive extreme of the Whorfian spectrum is research by Rozin, Poritsky and Sotsky (1971) who carried out a very small experiment teaching

Chinese characters to American English speaking children with severe reading disabilities. They found that reading 'English' through the medium of Chinese characters was easier for their subjects than reading alphabetic English. This experiment is widely cited in literature on literacy, particularly in the dual route debate, but hardly bears scrutiny, owing to the tiny number of subjects, the small number of characters they were taught, and the dubious results - some of the subjects managed to learn to recognise some of the characters. Nevertheless, this research epitomises some Western views that if it is Chinese it must inevitably be magically effective - basically, it has novelty value.

2. 3 English language lie tests don't work on Chinese speakers

Yang and Chiu (1988) claimed that lie tests carried out on Chinese speakers in the USA could not be effective because of 'the fuzzy boundaries ..among different Chinese frequency words' (Yang and Chiu 1988). However the words used as stimuli in the MMPI lie test are equally fuzzy in English: 'rarely,' 'seldom,' 'occasionally,' 'sometimes,' 'usually,' 'frequently,' and 'often.' There are adequate equivalents for frequency words in Chinese and English, and these findings show more about the dubious motivation of the lie test than the 'fuzziness' of the Chinese language. If you really need to do a lie test of this kind, the only reliable stimuli are 'always' 'sometimes' and 'never.'

Yang and Chiu also found that Chinese lie test subjects would rather give a wrong answer, than say 'I don't know', thus producing even more negative results. This is a finding of interest and relevance which I will refer to later.

2. 4 Writing Chinese characters is good for your heart

Kao, Robinson and Zhang (1988) found that writing Chinese characters with a traditional writing brush, rather than a biro, slowed pulse rates. Unfortunately they didn't bother to compare the activity of Chinese calligraphy with that of Arabic, Russian, Greek or English calligraphy - in other words, it is by no means certain that the calming effect of the activity was due to the Chinese language - it was more probably the calming effect of a focused, artistic activity.

These are just four remarkable theories about Chinese language and writing which are of relatively recent origin. Other well meaning, but ill considered theories about Chinese include the greater suitability of Chinese characters for the shape of the fovea (Woodworth 1938) , the greater ease of reading vertical lines of print rather than horizontal lines of print (Stern 1927) and of course the age old notion that Chinese characters are pictures.

3 Chinese academic achievement

Since the early 1980s the world has begun to notice that in international maths competitions Chinese children outstrip their peers of all nationalities. Educational surveys (eg Chan, Hoosain, Stevenson and others) suggest that Chinese children do far better at maths and sciences than for example, Japanese and American children, and some researchers say that they do better than any other ethnic group that has been tested. Chan, among others, has endeavoured to evaluate this notion. The tests used by Chan, include adaptations of Raven's Progressive Matrices, the Wechsler Intelligence Scales for Children and the Torrance Test of Creative Thinking specially designed for use in Hong Kong, Taiwan, Singapore and mainland China, (including some adapted by Chan himself) which are reckoned to be culturally fair, if that is possible.

Other studies of educational attainment tests have shown less clear results for Chinese children. Lesser, Fifer, and Clark (1965 cited in Hoosain 1991) found that Chinese children were inferior in verbal ability to Jewish, Puerto Rican and Black peers. Miron and Wolfe (1964 cited in Hoosain 1991) found that when given a sentence framework, Chinese subjects provided the highest number of word association responses, but McGinnies and Turnage(cited in Hoosain 1991) found that in free word association, Chinese subjects produced fewer words and were 'more reticent.' A study by Chan (1996) found a strong contrast in achievement between Chinese L1 students in Chinese medium schools and Chinese L1 students in English medium schools. Those in Chinese medium schools did better in Chinese and maths, but worse in all other subjects, while those in English medium schools did better in English and all other subjects except maths. The schools and pupils were matched as far as possible. These results would seem to suggest that there is something about the Chinese language which is good for maths, and something about English which is good for the arts and humanities.

Leong and Hsia (1996) note that there is a great deal of borrowing from English into Chinese by young people - could it be that Chinese students in the bilingual situation in Hong Kong find it helpful to use English for some of their school work?

3. 1 Chinese language and reading disability

Dyslexia does exist among Chinese readers, and Stevenson et al (1985) comparing Japanese, Chinese and American children, found that at certain levels Chinese readers were more likely to pass the vocabulary test and fail the comprehension test, while American and Japanese readers were more likely to fail the vocabulary test and pass the comprehension test. The general results of Stevenson et al's study suggested that Chinese readers with a reading disability showed more general disability in learning than the American and Japanese subjects, who showed more specific reading problems.

4. What makes the difference?

Of course there are loopholes in all these studies. Variables such as family background, diet, life long habit and so on can never be accounted for. However, judging by the reliable research to date, there must be something about the Chinese people or the Chinese language which affects academic achievement. Looking at this from the nature - nurture point of view, there are three possibilities. Firstly, it is possible to come down firmly on the nature side and say that the Chinese race as a whole is more intelligent than other races (Stevenson and Lee 1996). Secondly, it is possible to take a fairly strong Whorfian view and say that the Chinese language is perfectly suited for academic achievement of a certain kind. Thirdly, it is possible to come down firmly on the nurture side and say that it is Chinese upbringing and education that give Chinese children their head start in academic achievement.

The first point is delicate and difficult, and I will leave it to the psychologists. The second point I will deal with now.

4. 1 Psycholinguistic research on processing of Chinese

The raging debate on reading continues, and the Chinese psycholinguistic contribution has made it clear that English and Chinese both have a highly irregular sound to symbol correspondence and, much like English, Chinese characters are accessed both visually and phonologically (Chen 1996). Recent research has also established that psycholinguistic processing of Chinese takes place largely in the left hemisphere, as would be expected of linguistic and serial processing. Research on dyslexia, in both stroke patients and children with reading disability, has shown that patterns of dyslexia are not dissimilar from those of English, for example. Eye movements in reading Chinese have been found to be similar to those of English, but with average shorter saccades. There is no evidence that reading square, evenly spaced characters, or vertical lines, makes reading any easier or more difficult. From a physical, perceptual point of view, Chinese is a language like any other and an orthography like any other and is processed in much the same way.

4. 2 What makes Chinese different?

So, apart from our own ignorance, what is different about Chinese, that makes so many people believe it to be at one extreme, inadequate for expressing thought, or at the other extreme, the super language which will cure dyslexia?

Humboldt wrote that in Chinese sentences each word is arranged so that one carefully considers each relationship before reading on in the text. Since the relationships of ideas are produced by these relationships in the text, this pure unadulterated silence takes the place of grammar (Humboldt)[1]. What are these silences Humboldt writes of?

[1] This is my translation of Shen Xiao-long's Chinese translation of Humboldt's original.

They are famously referred to by Chinese scholars as *yan wai zhi yi* - 'the meaning outside the words.' In English we would refer to this as ellipsis or implicitness. Omission is so common in Chinese that these terms are hardly adequate. Parallel to this notion of implicitness is the notion of *fei bi mo neng xing rong* - 'pen and ink cannot describe', in other words, inexpressibility. The characteristics of Chinese - ellipsis, implicitness and inexpressibility - have no doubt been exploited by the educated literati of China throughout the ages in order to retain the mystery of education and learning, and they have almost certainly had an effect on culture and ideology. Huang Xuan Fan, refuting the idea that some things cannot be expressed in words, notes that Chinese philosophy has always centred on 'direct feeling' and is also 'wordless'. He says:

> 'It is not a coincidence that 'direct feeling' and 'wordlessness' have become the joint defining characteristics of Chinese philosophy and ways of thinking. Direct feeling is a process arrived at without clearly having undergone a reasoning out of the concept or without the support of evidence. In other words, awareness which does not make use of written or spoken language is 'direct feeling'' (Huang 1977: 19).

He is probably aiming his criticism at philosophers like Shen Xiao Long, who claims that the pictorial element in Chinese characters transcends the constraints of time and space and the constraints of dialect and geographical boundaries (Shen 1988). Without exploring factors such as practice, automatisation, and memorisation, he claims that modern psychology has proved that when reading phonemic orthography, one can only understand the meaning by means of analysing the sounds, but that through square format Chinese characters, one can access the semantic information directly through the picture (Shen 1988: 15). However, as noted above, most scholars now accept that Chinese characters are accessed both phonologically and visually. Moreover they can only be accessed at all if you have been taught how to!

4. 2. 1 The silences of Chinese

The magical difference of Chinese is not anything to do with Chinese characters, but is everything to do with the linguistic typology of the language. So I will give an account of Chinese grammar in three sentences. 1. Chinese has no inflection - no tenses, no genders, no cases, no number, no definite or indefinite articles, and even word order is not crucial to either production or reception.

2. The so called empty words, that is, the function words, such as 'if', 'but', 'and', 'so', 'because,' 'belonging to' etc. are very often optional (conditional clauses regularly appear without 'if' - the phenomenon which led to Bloom's assumptions, cited above).

3. Pronouns are marked - the norm is a zero pronoun: the topic, or subject of a sentence may be realised as zero, and the object may also be realised as zero.

These three crucial characteristics constitute Humboldt's 'silences'. The information in a Chinese sentence is contained almost entirely in content words, and almost entirely lexically - the Chinese reader or listener has much less grammatical information to assist in comprehending.

In addition, Chinese printed text has certain significant characteristics which may impede rather than aid the reader. Characters are spaced regularly - there is nothing to indicate where a word begins and ends. (Words do exist in Chinese but there is not always agreement as what constitutes a word.) There is no equivalent of upper and lower case, so beginnings of sentences and proper names are not indicated, except in classical texts used for educational purposes. Punctuation is indicated, but is more flexible than , for example, English, French, German punctuation.

4. 3 The Chinese educational environment

Now let us look at my third point, the effect of Chinese education, the nurture side of the dichotomy.

4. 3. 1 Brevity is the soul of memorisation

Because of the characteristics listed above, Chinese language in written and spoken forms, can be, and tends to be, very concise. In English we see its parallel in headlines and in note form. It is sometimes quite difficult to work out just what a newspaper headline is referring to, especially if one does not have specialist knowledge, and it is always difficult to read from someone else's notes. The shortage of information provided in Chinese may have two effects on the reader or listener. Unconsciously he or she may have to think harder to work out the details of the message - especially who is doing what to whom. In addition, the opacity of the message, particularly in rather abstract texts, (where causality and conditionality may not always be explicitly expressed) may cause the reader or listener to quote the text in its entirety, rather than paraphrase it. Thus the succinctness of Chinese may, on the one hand, make memorisation easier, and on the other, make memorisation more necessary.

4. 3. 2 Cross cultural attitudes to memorisation

Since the blossoming of 'child centred' learning in the UK in the late 1960s memorisation has been considered by many educationists in this country to be incompatible with understanding. Learning by heart has been disparaged, discouraged and even outlawed in British classrooms. In the Far East however, it is still the norm in classrooms. Chinese characters , though having some regularities which can be generalised, need to be learned holistically, especially in the initial stages of reading. The practice of memorisation , not only of individual characters, but of whole texts, was reinforced for hundreds of years by the state examination system in China.

'Small 'Chinese' children ... learning to read and write ... spend long periods of time engaged in repetitive oral as well as writing drills ... another way to look at all this work is that it requires specific answers that are labelled as either correct or wrong, rather than being open ended, free expressions of views or thoughts. ... Appeal to authority and adherence to what is perceived to be correct does not end with the beginning learner of Chinese reading and writing. Memorisation of any text that has to be learned may be considered an extension of specific script-sound-meaning associations in vocabulary learning. At higher levels in schools, particularly with the classical literature that secondary school pupils have to learn, memorisation of entire passages is still practised. Such learning habits eventually become an important part of cognitive style (Hoosain 1991: 94-95). It is interesting to note that Chen Daxing (1990), comparing comprehension of texts by native English and native Chinese readers, found that the Chinese subjects not only showed better recall in their native language, but also showed better recall of the English texts than the English native readers. Chen notes that he had to overtly discourage his Chinese subjects' habit of memorisation, as he was looking for spontaneous recall.

4. 3. 3 Chinese language and short term memory

While there is an apparent gulf between English language education and Chinese language education where memorisation is concerned, short term memory span affects all language processing.

Zhang and Simon (1985) compared short term memory spans for English and Chinese language materials, basing their study on measurement in terms of chunks as proposed by Miller (1956). For Chinese language materials, they found a non-phonological component of short term memory with a capacity of about three chunks, corresponding to Baddeley's 'visuo-spatial scratch pad.' For unnamed radicals (parts of a character) and homophonic characters, they found that recall was about three items. For non-homophonic characters, they found that recall was about seven items. Their findings led them to challenge the popular notion that Chinese readers encode characters 'directly' from visual to semantic form, without an intermediary acoustic encoding. (Zhang and Simon 1985: 196). They also found that familiarity was an important factor in recall, and that the Chinese STM span for digits was greater than the English STM span for digits.

5 **Summary and Conclusion**

5. 1 The Whorfian view

Let us look briefly at some of the points mentioned above. Chinese speakers have a longer STM span for digits. Chinese digits are very short - one syllable each, and multiples of numbers are strictly and highly regularly decimal. Could this be why Chinese children are better at Maths (Hoosain 1991)?

Chinese speakers have more word associations in a sentence framework, and fewer word associations in a free association situation. Could this be because they need the context to establish the meaning of the stimulus word and also because, in their educational environment, they rely on context being provided and then on memorising it?

Chinese school children appear to do better at the arts and humanities when they study these subjects in English medium - could this be because English, both through the medium of inflection and also by means of its wealth of function words, provides more explicit information about why and how things happen?

Chinese subjects taking lie tests are reluctant to say 'I don't know' - they prefer to give the wrong answer than to appear indecisive. Could this be the result of a lifetime of memorising, and the habit of regarding answers as right or wrong, as suggested by Hoosain, above?

I think it is possible to take a weak Whorfian view and say that, where academic achievement is concerned, perhaps the characteristics of the Chinese language itself do provide advantages in some respects, and disadvantages in other respects.

5. 2 The nurture view

Returning to the nature-nurture dichotomy, I would like to suggest that the nature of the Chinese language and Chinese traditional education combine to produce high achievers. Chinese is not necessarily more logical than Western languages, but it is much more succinct. The lack of information in a Chinese sentence compels the student to learn it by heart. At the same time, because it is succinct, it is easier to learn by heart than, for example, its equivalent English or French version.

What I would like to suggest is that literate Chinese people have rather more fixed schemata than speakers of other languages. If a text does not explicitly state who does what, and does not explicitly indicate causality, or conditionality or temporality, in order to remember the text and to pass it on to a listener, it may be desirable to memorise it in its entirety rather than paraphrase it.

This may even relate to neurological processes, for neuronal connections are strengthened from birth, and the effects of memorisation as in the Chinese system on the one hand, and discovery procedures in the Western system on the other hand , could have profound effects on the way people's brains work, even if the raw material is similar. At the same time, the habit of memorisation, the preference for a received wisdom, may affect cognitive style, as suggested by Hoosain above. It has been found that among Chinese children, those who work hardest are also considered to be the most able, whereas among American students of similar age, those who work hard are believed to lack ability (Stevenson and Lee 1996).

Intelligence has to do with the way the language works as well as the way society works. Chinese characters are no closer to thought than any kind of writing, but the way in which they trigger thought may be rather different, owing to the lack of information in the context in which the characters are embedded, a feature which both compels and assists memorisation.

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