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REVIEW ARTICLE

Good gibbons and evil macaques: a historical review on cognitive features of non-human primates in Chinese traditional culture

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Abstract For several thousand years the ancient Chinese have accumulated rich knowledge, in the form of written literature and folklore, on the non-human primates widely distributed in China. I have used critical text analysis and discourse analysis to clarify when and how ancient Chinese distinguished gibbons from macaques. I divided the progress into four main stages, the Pre-Shang to Shang dynasty (before 1046 BC), the Zhou to Han dynasty (1046 BC–220 AD), the six dynasties to Song dynasty (220–1279 AD), and the Yuan to Qing dynasties (1279–1840 AD). I found that China's traditional cognition of gibbons and macaques emphasized the appearance of animals, organoleptic performance, or even whether or not their behavior was "moral". They described them as human-like animals by ethical standards but ignored the species itself. This kind of cognitive style actually embodies the "pursuit of goodness", which is the feature of Chinese traditional culture. This study presents some original views on Chinese traditional knowledge of non-human primates.

Keywords Chinese traditional culture · Non-human primates · Gibbon · Macaque · Cognitive feature

Introduction

In the 4th century BC, Aristotle wrote the first scientific records of non-human primates (as primates in bellows). In the 18th century, Linnaeus first divided primates into two main categories: the ape and the monkey. Primatology is currently booming in several fields, e.g., anthropology, zoology, psychology, and medical science (Zhang 2012). Most primatological studies focused on the natural science of living primate populations or fossil primates that lived millions of years ago (Fleagle 1999). There are, however, few studies on the historical attitude of people to the primates in their countries (Li et al. 2002; Keeley 2004; Loudon et al. 2006; Asquith 2011; Radhakrishna et al. 2012). This knowledge is important for describing the relationship humans have had with primates from historical and contemporary perspectives (Wolf and Fuentes 2007; Fuentes and Hawkins 2010). Researchers may face difficulty when attempting to accumulate historical information about primates in Western culture (Asquith 1986; Tachibana 1991; Matsuzawa and McGrew 2008), because there is only one macaque species in the west corner of Spain and no apes in the West until the first living ape was carried to Europe in the 17th century (Tulpius 1672). It was not until the end of the 18th century that a gibbon was recorded in the West (Buffon and Sonnini 1766). De Buffon's information about the gibbon came from the French possession in India where the gibbon occurred in Assam and upper Burma (Van Gulik 1967).

The primates main habitats are the countries of Asia, Africa, and Central and South America (Fleagle 1999). More than 24 living primate species and 40 fossil species have been found in China (Zhang and Watanabe 2009; Roos et al. 2014). Similar to other primate habitats, China has accumulated rich information on primates since ancient times, especially on gibbons and macaques (Wang 1997). China is home to no fewer than six gibbon species (*Hylobates leucogenys, H. Lar, Nomascus hainanus, N. nasutus, N. concolor, N. leucogenys*) and seven macaque species (*Macaca mulatta,* M. *thibetana*, *M. assamensis*, *M.*

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arctoides, *M. cyclopis, Macaca leucogenys* and *M. Leonina*; Roos et al. 2014; Li et al. 2015). Gibbons and macaques have different morphology, living habits, behavioral ecology, and social structure. The former have longer arms, are more arboreal, have a smaller home range, are more frugivorous, and live in smaller groups than the latter (Campbell et al. 2007). In addition, the former stay away from human settlements whereas the latter, especially *M. mulatta*, are distributed widely in rocky hills, valleys, and groves and become pests by raiding cultivated crops. Chinese called gibbons apes (Yuan, 猿) and macaques (and colobines) monkeys (Hou, 猴).

Several studies have focused on primates in Chinese traditional cultures, including novels (Zhu and Liu 2002; Qin 2010), legends (Xing 2005), painting (Van Gulik 1967; Geissmann 2008; Li 2008), poems (Liu 2008), and monkey shows (Zhao 2006). Van Gulik (1967) reviewed the different kinds of gibbon image on Chinese serving ware and in literature and art over 3000 years from the Shang dynasty (ca 1500 BC) to the early Qing dynasty (1644 AD), and discussed the gibbon's role in Chinese traditional cultures. Gulik's main text is divided into three parts. In part one, he described the earliest data relating to gibbons in China from ca 1500 BC until the beginning of the Han dynasty (202 BC). Part two gives a general picture of the gibbon as it appears in the literature of the Tang dynasty that ended in 907 AD. Part three is mainly concerned with pictorial representations of the gibbon in the art of the Song, Yuan, and Ming dynasties (960–1644 AD). In recent years, Geissmann (2008) surveyed 818 gibbon paintings in China, Japan, and Korea and quantified the production of gibbon paintings in the different periods of these countries' history. The results suggested that gibbon art in China dates back to at least the Han dynasty (206 BC–220 AD) and the first gibbon paintings were produced in the 9th century. He also documented changes in the style and context of gibbon paintings that occurred in different historical periods. Qin (2010) discussed the origin of the Chinese Monkey King (Sun Wukong) by analysis of traditional perceptions of primates. Sun Wukong is a major character in the Chinese classical novel *Journey to the West*. In the novel, he is a monkey born from a stone who acquired supernatural powers through Taoist practices. He later accompanied the monk Xuanzang on a journey to retrieve Buddhist sutras from India (Shahar 1992). As one of the most enduring Chinese literary characters, Sun Wukong has a varied background and a colorful cultural history. Qin (2010) pointed out the origin of Sun Wukong may be influenced by both the Hindu deity Hanuman from the Ramayana and elements of the Chinese folklore of macaques, leaf monkeys, and snub-nosed monkeys. These indigenous elements made if possible to accept foreign elements. However, previous studies mainly focused on specific subjects, either the gibbon or the "Sun Wukong", and did not mention differences between the two animals in Chinese traditional understanding, or when the ancient Chinese noticed the difference between apes and macaques.

In this study, I attempt to scan the course in which people drew their distinction between gibbons and macaques in ancient China from before ca 1600 BC to 1840 AD, on the basis of a survey of the online data resource "The basic Chinese ancient books library". This online library provides digital versions of 10 thousand ancient Chinese books dating back to the 11 century BC. I used the Chinese keywords "yuan" (猿 or 猨), "Huang-hei" (黄黑), and "Tongbi" (通臂) for gibbon in ancient records, and used the keywords "Hou" (猴), "Nao" (猱, 獶), "Ju" (狙), "Yu" (禺), "Mi-hou" (獼猴), "Ma-lv" (馬騮), "Ma-hua" (馬化), and "Hu-sun" (猢猻 or 胡孫) for macaques (Qin 2010). Ancient records are not scientific and it is often difficult to identify the species in text. It is however easy to identify the gibbon genus and the macaque genus, although the authors misunderstand and regarded the snub-nosed monkey and leaf monkey as apes in some literature. I omitted these unclear records and used those from which I could identify the animal as either gibbon genus or macaque genus. I identified a total of 1884 gibbon records and 1068 macaque records. I also referred to pertinent research articles as mentioned above. My intention was to answer two questions in a cognitive anthropological manner.

1. When did the ancient Chinese begin to clearly describe the differences between apes and macaques?
2. How did the Chinese traditional thinking patterns differ from modern science that originated in the West?

This study is expected to fill a research gap in our knowledge on primate cultures and to present some original views on Chinese traditional knowledge on primates.

Pre-Shang and Shang dynasties (before 1046 BC): distinguishing between gibbons and macaques may be obscure

Primitive society

Chinese recorded primates in their daily life as early as in primitive society. At the Houwa site in Donggang city, Liaoning Province, dating ca 5000–6000 years ago, a piece of carving from the Neolithic age was found (Pu and Wang 1987, Fig. 1a). Its front is a primate face whereas the back is a human face. Sculpted in minimalist style, it looks like a talisman or accouterment for good fortune. A jade carving in a primate shape was unearthed at the Shangzhai site, Beijing, from ca 6000–7000 years ago (Fig. 1b). Though unskillfully carved, this artifact has caught some typical

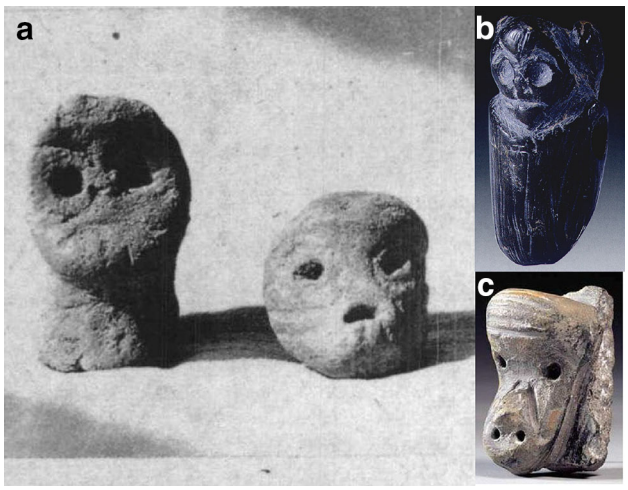

Fig. 1 Primate samples from Chinese primitive society. **a** Primate carving found at the Houwa site in Donggang city, Liaoning Province, dated from ca 5000–6000 years ago (photograph cited from Pu and Wang 1987). **b** Jade carving of a primate shape unearthed at the Shangzhai site, Beijing, from ca 6000–7000 years ago (photograph cited from Yu and Wang 1989). **c** Clay sculpture with primate's face unearthed at the Qugong site, Lhasa, in 1992 (photograph of sample in Tibet Museum http://xzbwg.orgcc.com/)

features of primates (Yu and Wang 1989). A clay sculpture with a primate's face was unearthed at Qugong site, Lhasa, in 1992 (Fig. 1c). The pottery belongs to the late Neolithic age in Tibet (Tibet Museum http://xzbwg.orgcc.com/). Fossils of *Macaca spp.* have been discovered at all these sites (except the Qugong site), which suggests people may have encountered wild primates around their settlements (Wen 2009).

The Shang dynasty[1](1600–1046 BC)

Many relics of primate culture from the Shang dynasty have been discovered. Twenty-nine types of mammal (fossil) including macaques were unearthed at the Anyang Yin Ruins in 1949. Twenty-eight horses, 3 primates, 1 deer, and 15 other mammals were found buried in a big tomb at Wuguan village. Jade sculptures of primates were also found in Fuhao Tomb and the settlement site of Xiaotun village (Guo et al. 1999). These sculptures show monkeys being raised in houses and living with humans, which indicates monkey shows or monkeys as pets occurred in the late Yin royal family (Shi and Hu 1997).

The first Chinese character for "primates", i.e., Nao 夔 (I use Chinese characters here, and below, as a reference to primate names) appeared in oracle bone inscriptions (ca 11 century BC). The character represents the monkey's side posture, which may stand for Di-ku 帝喾 (2480–2345 BC), the great emperor of the Shang people (Xu 1989). Guo et al. (1999) pointed out that because quite a few tribes descending from Di-ku were known for cattle raising, people in these tribes may started breeding macaques in horse stables, a traditional way of protecting horses from diseases (Hironaka 2003). Van Gulik (1967) divides the Chinese character of Nao into two types. Type A stands for the macaque, which has short arms and a short tail. Its fur is smooth and short, only very young macaques have slightly longer, fluffy fur as indicated by the graphic on the extreme right. Type B are pictographs of gibbons or a larger monkeys with a kind of mane. Some graphics added at the bottom have a separate sign which might indicate that this monkey walks erectly. In some texts, the larger monkey does not have tail. Gulik suggested that the Type B of Nao may be related with or a latter development of the word for gibbon (Yuan, 猿). If Van Gulik's analysis is correct, it can be concluded that characters for "gibbon" had existed in the Shang period, and people had differentiated gibbons from macaques at that time.

But I hardly support this conclusion. The "two types of Nao" may be a result of the development of Chinese characters. As Li (1995) pointed out that inscriptions on oracle bones lasted 273 years in the Yin-Shang period. During this time, people's constant adjustment and improvement to oracle bone inscriptions, made the shape and structure of one character change at different times and occasions. Oracle bone inscriptions in the Yin Ruins were inscribed or written by over a hundred priest-scribes. The individual education backgrounds, the sharpness of knife tools, the texture of oracle bones, etc., can affect the thickness, directions, and styles of each stroke. In addition, different writing types of Nao represent the trend of oracle bone inscriptions' development, in which characters are becoming less graphic, more abstract, and linear (Fig. 2). In addition, Guo et al. (1999) and Wang (2008) noticed Nao is a county name located in Hubei province, central China, where gibbons, snub-nosed monkeys, and macaques were found. Local people used to call macaques Nao. In modern Cantonese macaques are also called maa-lau, which originates from Nao (nau–mlu–maliu–maalau, Wang 2008). These historical clues suggest ancient Chinese used Nao (猱) for macaques, and Van Gulik (1967) may been mistaken in interpreting Nao as gibbon. Such mistakes also occurred in some scholium books after Ming dynasty (Qin 2010; more details are given in the section "Yuan, Ming, and Qing dynasties (1279–1840 AD): discrimination and confusion of gibbons and macaques"). I suspect distinguishing between gibbons and macaques was still obscure in the Shang culture.

[1] Because information about primates in the Xia Dynasty is limited and the existence of Xia is still under dispute, this section will not start with Xia material but turn to the earliest Chinese Dynasty with reliable historical data—the Shang.

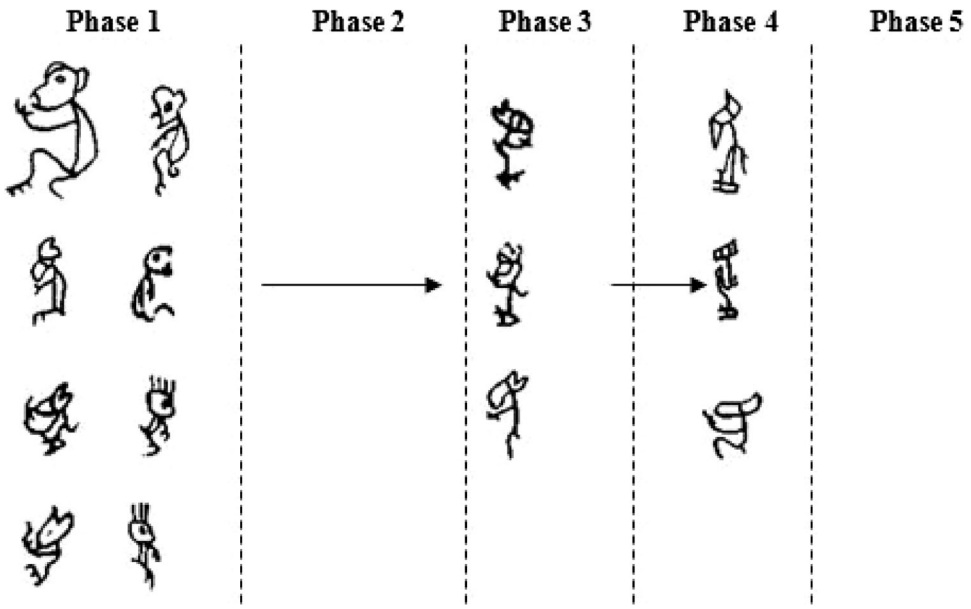

Fig. 2 Evolution of nao graphics on oracle bones. Samples and periods of the graphics are listed in accordance with *The Oracle Bone Inscriptions Dictionary* (Xu 1989). Here, graphics which represent macaques, as Van Gulik (1967) claims, are similar to samples in Phase 1; graphics of Van Gulik's type B, viz. the gibbon ones, are similar to phase 3 and 4 samples. So the two types of graphic do not represent two different animals but are related to scripts under the heading nao (related to one animal only) which change during this time period. Some variants are not just a kind of graphemic change, but may refer to a large monkey or an infant. However, distinction between gibbons and macaques may not be apparent from them

Zhou, Qin, and Han dynasties (1046 BC–220 AD): clear distinction between gibbon and macaques

Zhou–Qin dynasties (1046–207 BC)

People distinguished gibbons from other animals in the Eastern Zhou period (770–221 BC). Gibbon-shaped silver ornaments have been discovered at Qufu city (the old capital of the Lu Kingdom) and several other sites of the Zhou dynasty (Geissmann 2008). The Chinese characters for gibbon (蝯, 猨, and 猿) have emerged and have the same pronunciation (yuan).

The *Lv-shi-chun-qiu* (呂氏春秋, 239 BC) notes a story of Yang Youji shooting the white gibbon who has long arms, and moves quickly and quietly.

Shan-hai-jing (山海經, 202 BC–9 AD) records "there are a lot of trees, white gibbons, crystal and gold in the Tangting mountains… "; "there are no grass or trees, but plenty of water and white gibbons in the Fashuang mountains…"; and "A lot of white jade lies there, while animals are mostly rhinos, elephants, bears, and plenty of gibbons and snub-nosed monkeys…"

Chu-ci (楚辭, BC 310–BC 278) writes that "the thunder rumbled and the rain continued; gibbons sing and snub-nosed monkeys call at night." Then "the deep, gloomy forest is where gibbons and snub-nosed monkeys live."

There were also many names for macaques at this time (e.g., Nao (猱, 獶), ju (狙), yu (禺) and mi-hou (獼猴)). *Shi-jing* (诗经, ca 1059–476 BC) says "never teach a macaque (Nao 猱) to climb trees." *Li*-ji (禮記, ca 202 BC–9 AD) notes that "performers play and dance in disarray, like a group of macaques (nao 獶)." Some traditional books recorded folklore stories of primates, which can be found in *Lie-zi* (列子, 375 BC); *Zhuang-zi* (莊子, 286 BC); *Han-fei-zi*(韓非子,233 BC); *Guan-zi* (管子, 221 BC); *Zhan-guo-ce* (戰國策, 6 BC); and *Er-ya* (爾雅, ca 475 BC–9 AD). People recorded gibbon and macaques as different animals and invented different Chinese characters for them in the Zhou-Qin dynasties. They did not, however, describe the detailed differences between the two animals and their emotional judgment of them was not biased.

The Han dynasty (206 BC–220 AD)

In the Han dynasty, people started to describe morphological characteristics of gibbons that were different from those of macaques, for example sexual dimorphism in fur color, arm length, etc. *Shang-lin-fu* (上林賦, 117 BC) notes, "black male gibbons and white female gibbon, snub-nosed monkeys and flying squirrels…" *Shi-ji* (史記, ca 101–94 BC) notes "Li Guang, the famous general in Han dynasty, has long arms as the gibbon's, and he was born to

shoot." People having long arms were considered to be good at archery in Chinese culture.

People also noticed gibbons have longer life span than macaques, and stressed that gibbons acquired some kinds of occult power to prolong their life to several hundred years. *Chun-qiu-fan-lu* (春秋繁露, 104 BC) notes "The reason why gibbons are macrobian is that they do well in stretching their bodies, and therefore the blood circulates smoothly." *Yun-ji-qi-qian* (云笈七簽, 1027 AD) says, "Ancient Taoist priests move their body like gibbons, stretched their joints, in order to remain young forever." Later, gibbons became symbols of mystery and longevity in Chinese culture. This thinking was carried forward in Yue-nü-jian (越女劍, ca 475 BC), which created a male gibbon named "Yuan Gong". Yuan gong has grandfather-like appearance, vigorous movement, and everlasting longevity, and his whereabouts cannot be discovered.

People in the Han dynasty often saw macaques in monkey-shows. The monkey-show became a classic form of acrobatics in this period (Zhao 2000). Scenes in which humans are playing with macaques have been found on Han cultural relics (for example tomb murals or portrait bricks) excavated in Liaoning, Shandong, and Henan provinces. *Huai-nan-zi* (淮南子, ca 202 BC–9 AD) recorded "a person in Chu kingdom cooked a macaque and invited his neighbor to share the meat; The neighbor vomited all his food after knowing that it was meat of a monkey." The macaque in texts of this period is always vulgar, worthless, or derided. As macaques are cooked to provide meals, the gibbons in text of the same book "enjoys itself in dense forests"; "When the king of Chu kingdom lost his gibbon, he cut down all of the forest to find his gibbon." It is not difficult to believe that preliminary different opinions about the two animals emerged in the Han dynasty, namely valuing the gibbon while despising the macaque.

Six dynasties[2] to the Song dynasty (220–1279 AD): the ethicization of judgments on gibbons and macaques

The six dynasties (220–581 AD)

Chorography and tales about the gibbon

The six dynasties is an unusual period in China's ancient history, characterized by fission and fusion in human societies and large population flow among different kingdoms. Culture exchange flourished in this period, which promoted the development of Confucianism, Buddhism, and Taoism. All these led to increasing interest in nature. A large number of geography books appeared at this time. Unlike works appearing later, those of the six dynasties featured mountains, rivers, topography, and other natural scenery, which were of strong humanity in character, and contained numerous depictions of gibbons.

Gibbon calls had been a vital aspect of Chinese classical literature. Yuan-kang-di-ji (元康地記, ca 280–289 AD) noted "Gibbons and macaques do not inhabit the same mountain, calling each other at around dawn". Yi-du-shan-chuan-ji (宜都山川記, 401 AD) noted "the gibbon calls in SanXia valleys are so clear that they spread among valleys, desolate and never stop", "gibbon calls in the SanXia valleys are sorrowful. Men cries after hearing the gibbon calls". *Shui-jing-zhu* (水經注, 527 AD), the chorography of Northern Wei dynasty, recorded gibbons in a variety of habitats.

Gibbons' behavior were also recorded in some short tales of the six dynasties. *Sou-shen-ji* (搜神記, 336 AD) wrote "a man took a baby gibbon from nearby mountains; the next day the mother gibbon chased him to his home and begged the man for returning her baby"; "the mother gibbon died with sadness, and later the man's whole family were sentenced to death by the society." *Hua-yang-guo-zhi* (華陽國志, 354 AD) narrated "A gibbon was shot by a hunter. It extracted the arrow with its hand and put herb-medicine to treat its wound." These may be partly untrue, including some exaggeration or hearsay, but people in six dynasties noticed gibbons have close parenthood that influenced people's views of the animal in Chinese traditional culture.

Views of the gibbon in the six dynasties

The view that the gibbon was a kind of celestial being became popular during the six dynasties. In the *Bian-dao-lun* (辯道論, 232 AD), the author questioned. "Are celestial beings macaques or gibbons?…Or are they common people who obtain occult power and become celestial?" *Bao-pu-zi* (抱樸子, 364 AD) noted "a macaque of eight-hundred-year old turns to be a gibbon. A gibbon aged 500-year old turns to be a large monkey (Jue 玃). The large monkey can live for more than 1000-year old." *Shu-yi-ji* (述異記, 508 AD) also noted "A gibbon of 500-year old turns to be a large monkey. A large monkey of one-thousand-year old turns to be an old man." Both presented the gibbon as a longevous and transmutative animal. *Shan-hai-jing-tu-zan* (山海經圖贊, 324 AD) rewrote the story that Yang Youji easily shot a gibbon in the Zhou-Qin period: "The white gibbon knows the archer can hit a target beforehand, and find ways to avoid being caught… It means fate always changes in the world. Happiness sometimes might turn to be calamity."

People viewed gibbons as animals with good manners, and started to call them "gentleman". *Tai-ping-yu-lan* (太平御覽, 983 AD) and *Bao-pu-zi* (抱樸子, 364 AD) noted

[2] Or 'Six Courts'.

Table 1 Definition of gibbons and macaques in the primary dictionary and scholium books of the six dynasties

Resource	Gibbons	Macaques
Yu-pian (玉篇, 543 AD)	[Yuan, 蝯] interpreted content—it looks like a macaque but larger, and can sing a song	[Hou 猴] it have the consonant of hu and the vowel and tone of gou (macaques)
Shan-han-jing-zhu (山海经注, 324 AD)	[Yuan 猿] it looks like a macaque but larger, with long limbs and agile. They can be black or yellow. Their calls are sorrowful	
Mao-shi-cao-mu-niao-shou-chong-yu-shu (毛詩草木鳥獸蟲魚疏, 1791 AD)	[Yuan 猨] is gibbon with long arms; [Chan-hu 獑胡] is gibbon with white waist. Both Yuan and Chan-hu move faster than macaques, and their calls are louder	[Nao 猱] is a macaque. It is signified as mi-hou [獼猴] or mu-hou [沐猴] in some kingdoms. [Jue 玃] refers to old macaques

"the whole army of Zhou kingdom vanished during the south expedition… Gentlemen in the troop turned to be gibbons or cranes, while the others turned to be worms or sand." A similar description of gibbons is found in *Ai-jiang-nan-fu* (哀江南賦, 581 AD). Gibbons became symbols of gentlemen, with longevity because of their goodness. This ethical evaluation is still not prevalent in the six dynasties and we will see it becoming a key concept for gibbons in future dynasties.

Chorography and tales about macaques

There is little literature describing macaques as longevous or animals with good manners (*Bao-pu-zi,* 364 AD). It is more common to find stories that macaques are raised in human settlements and died distressingly, such as those in *Jin-shu* (晉書, 420 AD) and *Yuan-hou-fu* (猿猴賦, 278 AD). There are many notes on monkey-shows, which became very popular during the six dynasties (Qin 2010). *Shen-xian-zhuan* (神仙傳, 364 AD) first recorded crop raiding by macaques, probably because people extended their crop fields to mountain edges (Zhao 2000). There are still many stories with negative opinions of macaques at this time, for example records in *Fa-xun* (法訓, 270 AD), *Collection of humor and persiflage* (俳諧集, 453 AD) and *Mi-hou-fu* (獼猴賦, 278 AD). The basic understanding at the time was that macaques are easily caught; they seem comical and silly. Thus, they can be trained for entertainment; and they often raid crops.

Table 1 summarizes statements on differences between gibbons and macaques in the primary dictionary and scholium books of the six dynasties. People in this period have distinct views on primate behavior, but have little knowledge of the animal itself, e.g., primate taxonomy.

The Tang and Song dynasties[3] (618–1279 AD): good gibbons and evil macaques

The traditional view of "good gibbons and evil macaques" originated during the six dynasties and matured in the Tang–Song period. During the Tang–Song period, literati and travelers often explored mountains to note wild animals and plants. They not only featured simple depictions, but revealed more personal sentiments in their notes. These materials present a vivid outline of differences between gibbons and macaques.

As an example, the author of *Xuan-yuan-fu* (玄猿賦,[4] 217 AD) wrote a comprehensive description of gibbon behavior: "Gibbons and macaques dwelled on different mountains; being of different nature, they could encounter with each other. The disposition of the gibbon was quiet and constant he tended to show benevolence, humility, filial piety and compassion. Gibbons lived in a group. They let others eat first, and drank one after the other. If one got separated from the group, he would wail in sorrow. They traveled in an order. When confronted with danger the gibbons placed young individuals in their midst (to better protect the young). They did not trample the crops in the field, and they would carefully check the fruits of the trees to ascertain whether they were ripe. They would call their group members to eat together with peace and enjoyment. They protected trees to grow, and walked carefully at around young plants and tree sprouts on their mountain. Therefore, those mountains where gibbons dwelled in used to be covered by dense forests."

Macaques, on the contrary, are irascible and vociferous in nature. *Zeng-wang-sun-wen* (憎王孫文, 819 AD) noted: "they are always wrangling and shouting among each other, and jabbering confusedly. Although they lived in groups, they were by no means well-disposed towards each other. While feeding, they bite and snap at each other, they move about in unruly groups. They had no fixed orders while drinking. They do not mind getting separated, and when confronted with danger they always put their young in front (so as to be able to escape by themselves). They love to raid crops. They gnaw at unripe fruit and throw it away after the first bite. They steal people's food and filled it in their cheek pouches. They trample down or uproot

[3] There is comparatively little material about the Sui Dynasty (581-618 AD) preceding the Tang. Thus it is not mentioned here.

[4] Van Gulik (1967: 54) translates it as poetical essay on the dark gibbon.

young plants and tree shoots in their habitat mountains. Therefore, the mountains where the macaques lived are always bare." *Zeng-wang-sun-wen* (憎王孫文, 819 AD) further noted: "macaques are the most hateful creatures. Now I was exiled in these mountains for a long time and carefully observed these animals. I composed an essay on the hateful macaques." We can find similar descriptions in two other essays, *Poetical Essay on the White Gibbon* (白猿賦, 850 AD) and *Essay on Training Gibbons* (馴猿賦, 800 AD).

With further development of Buddhism in China in the Tang–Song period, images of primates appeared in different types of literature. Table 2 reveals a clear increase in the number of poems mentioning primates from the Han to Song Dynasties The gibbon is more favored in poetry as the macaque is apparently left out. A similar tendency can be found in the paintings and short stories from the Sui and Tang to Song dynasties (Li 2008; Qin 2010). It is safe to conclude that the view of "good gibbons and evil macaques" spread out and became mainstream thinking during the Tang–Song period.

Yuan, Ming, and Qing dynasties (1279–1840 AD): discrimination and confusion of gibbons and macaques

Varied remarks on gibbons and macaques

Human population increased rapidly during "the Yuan, Ming, and Qing dynasties, and primate populations decreased rapidly for a variety of reasons, e.g., forest loss, over-hunting, and temperature decrease (Wen 2009; Ma 1997, Zhou and Zhang 2013). People of this period had few chances to encounter a living gibbon and macaques in the same place, which may have increased their confusion about the characteristics of these two animals. For example, in some illustrations in a Ming dynasty encyclopedia a gibbon with a short tail looks just like a macaque (Fig. 3).

The authors of *ya-su-ji-yan* (雅俗稽言, 1623 AD) and *Shuo-wen-tong-xun-ding- sheng* (說文通訓定聲, 1834 AD) referred to descriptions of gibbons and macaques in the Tang–Song period but doubted there were clear differences between the two animals. It seemed so hard for people at this time to see a gibbon and a macaque simultaneously that they simply mixed up their names as one in the book *Tan-xiang-min-gong-yi-ji* (譚襄敏公遺集, 1545 AD). Another example is *Compendium of Materia Medica* (本草綱目, 1590); the author, Li Shizhen, listed macaques as the top item of the category "yu" (primates) and listed gibbons in the addendum to the item "rong" (snub-nosed monkey). The author included medicinal values of macaque's meat, skulls, paws, skin, and excreta, and added five prescriptions on the basis of previous work and his experience. Nevertheless, he made some mistakes in description of gibbons, which indicates he also had little chance to see a living gibbon at that time.

People around Shanghai were confused by the words Yuan (gibbon) and Hou (macaque), and they sometime called the macaque "yuan" without understanding the exact meaning of this word (e.g., in *Liu-jia-shi-ming-wu-shu* 六家詩名物疏, 1622 AD). More records alike are available. The Qing literati Li Daoyuan wrote, "There are many gibbons in Qiongzhou … gibbons use crops to make wine and hide it under rocks." Because of the words "rocks" and "rice field", I assume it should be macaques and the author misunderstood the animal as a gibbon. Similar mistakes can be found in *Kuai-ji-xian-zhi* (會積縣志, 1936 AD), *Pu-tuo-shan-zhi* (普陀山志, 1625 AD), and *Zhang-hua-xian-zhi* (彰化縣志, 1834 AD). The authors of these books wrote "gibbon often raiding crops such as beans, wheat and vegetable" or "Gibbons and mice often infest barns or kitchens." People often confused usage of the names for gibbons or macaques in the texts of the Yuan, Ming, and Qing dynasties.

Increase in aesthetic differences

In fact, because monkey-shows prevailed among civilians during the Tang–Song period, one of people's impressions about the macaque was that the animal was clever and smart. By the middle of the Ming dynasty, stories of the monkey King in *Journey to the West* (西遊記, 1560 AD) brought a positive image to macaques. These are main changes in understanding of macaques in this stage. Although the positive image of the monkey King challenged traditional Chinese culture on primates, it did not change the view of "good gibbons and evil macaques".

Discrimination between the gibbon and the macaque still exists in some of Yuan, Ming, and Qing culture. The first is poetry. There are 462 "gibbon" characters and 23 "macaque" characters in the poetry collection, *Lie-chao-shi-ji* (列朝詩集, 1698 AD), the former being nearly 20 times more than the latter. Another poetry collection of the Qing dynasty, *Qing-shi-bie-cai-ji* (清詩別裁集, 1760 AD), contains almost 120 poems relevant to gibbons yet only 5 for macaques. The gibbon is always depicted as beautiful, quiet, dolorous, and seclusive whereas the macaque keeps showing up with such expressions as "subdue" or "tame", indicative of a sharp contrast between people's judgment of the two animals. In opera, also, gibbons are more highly regarded than macaques. In the six plays associated with macaques, none shows the animals as celestial. In contrast, 6 of 7 plays relating to gibbons in *Qu-hai-zong-mu-ti-yao* (曲海總目提要, 1928 AD) depict the animal as celestial. In operas, the traditional image of macaques is that they are

Table 2 Record of primates in literature collections from the Han to Song dynasties

Name of literature collection	English Name	Numbers of records in the literature collections	
		Gibbons	Macaques
Chu-ci (楚辭, ca BC 310–278)	Poetry anthology of Han dynasty	4	2
Liu-chao-shi-ji (六朝詩集, ca 1522–1566 AD)	Poetry anthology of six dynasties	40	6 (1 appeared in poems' title)
Quan-tang-shi (全唐詩,1705 AD)	Complete collection of Tang poems	1338 (55 appeared in poems' title)	55
Quan-song-shi (全宋詩, 1986 AD)	Complete collection of song poems	2637 (105 appeared in poems' title)	201 (10 appeared in poems' title)

Fig. 3 The macaque (*left*) and the gibbon (*right*) in *San-cai-tu-hui* (三才圖會, 1607 AD). *Circles* added

mostly goblins with poor theurgies, and lack celestial blood of dignity and mystery compared with gibbons. The only exception is the monkey King. In literary sketches and fables, satire on macaques is also easily found. Authors depicted macaques as careless, drinking to excess, and stingy in the texts *Shuo-pu-shi-yu* (說圃識余, 1630 AD) and *Xiao-lin-guang-ji* (笑林廣記, 1791 AD).

Monkey-shows may emphasize the public view of "good gibbons and evil macaques". During Ming-Qing time, monkey-show trainers take monkeys out of the theaters to crowded streets, where they trained macaques to beg for small rewards from people. Although the stories of the monkey King give a positive image of macaques, the influence on literature is limited and it has little influence on people's attitudes toward macaques in reality. As previously observed, after the Song dynasty, macaque crop-raiding became an even more serious problem and brought more tension between farmers and macaques. In contrast, people believed gibbons hiding in the deep mountains were mysterious animals. In a word, during the Yuan, Ming, and Qing Dynasties, the public to some extent confounded specific differences between "gibbons" and "macaques", but the view of "good gibbons and evil macaques" remained.

Discussion and conclusion

I have traced progress in the development of knowledge about gibbons and macaques in ancient China. Chinese people had noticed differences between gibbons and macaques since very early time, but they used different methods from those of modern scientific classification. Figure 4 provides an outline of main content of the text above. Monkey-shaped relics occurred early in primitive Chinese society (ca 5000–6000 years ago). The image of "good gibbons and evil macaques" occurred in the Han Dynasty (202–220 BC). This image developed and was

amplified in subsequent periods. People in habitat countries have a long history and many chances to encounter wild primates; this is the basis of their traditional cultural opinion of primates (Loudon et al. 2006; Wolf and Fuentes 2007). The development of "good gibbons and evil macaques" in Chinese traditional culture reflects relationships between people and nature in history. People did not clearly distinguish macaques from apes before the Han dynasty. Records and stories about primates progressed when many people explored the wild in the Han to Tang–Song dynasties (618–1279 AD). Macaques are often pests in crop fields, whereas gibbons are mysterious in deep forests. As a result, people regard gibbons as charismatic and gentle animals but treat macaques as coarse and clamorous animals (Fig. 4). This cognitive view may be associated with experiences as a result of the close contact between people and primates. Although positive views of gibbons dominated in traditional Chinese culture, several negative images arose in stories of the Tang dynasty, e.g., gibbons haunted houses, or white gibbon kidnaps human wife, etc. This is probably related with a prevailing tradition of raising gibbons as pets during the period, so these stories often take place in or around human settlements. In the Yuan, Ming, and Qing dynasties (1279–1840 AD), primate populations (especially gibbons) decreased rapidly, probably because of serious deforestration and increased hunting by humans (Li et al. 2002; Zhou and Zhang 2013). People hardly saw gibbons and macaques at the same time, and started to confuse the classification of the two animals (Fig. 4).

It is interesting that the image of "good gibbons and evil macaques" prevails in these periods. A prominent feature of Chinese traditional culture as related to primates is that people focused on the animals' behavior and even "morality", rather than on their anatomy or categories. Taking data for the six dynasties, for example, people at that time have a variety of folklore and obviously held different attitudes toward the two; however, few words were written on their biological characteristics. The most apparent difference between gibbons and macaques for us today is the animals' body structure: with or without cheek pouches and tail. In the 4th century BC Aristotle separated primates into groups on the basis of whether they "have a tail". Subsequently, western researchers devoted themselves to anatomical and comparative studies of apes and monkeys (Fleagle 1999; Zhang 2012). I, however, found hardly any descriptions of primate anatomy in Chinese ancient literature.

To answer the question why there is a disparity between the naming of apes and macaques, I performed discourse analysis of Chinese traditional culture and archives. In Chinese traditional culture, people tended to use personification to differentiate animals on the basis of human standards. They categorized gibbons as good and macaques as evil, ethical standards used to describe human beings. Chinese ancients had close contact with the animals for long periods of time, because both gibbons and macaques were widely distributed or raised by humans. Wang (2009) pointed out that obscurity of primate knowledge in ancient Chinese cultures may be because literati favored textual

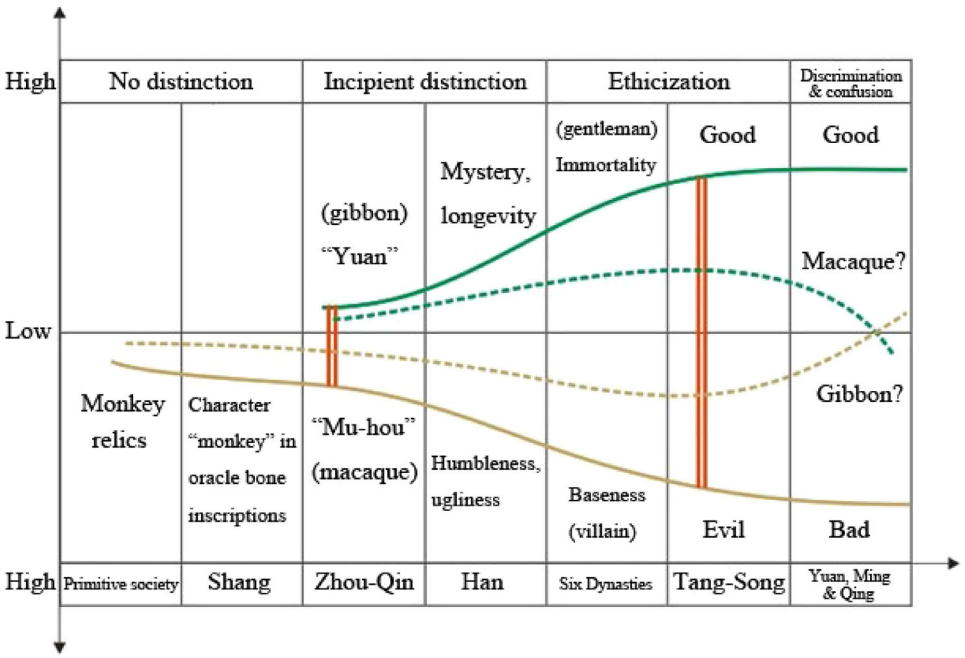

Fig. 4 Distinction between the gibbon and the macaque in ancient China. The abscissa represents China's history (each stage of the text in ancient China); the ordinate represents people's cognitive level of animals (as there is more knowledge of, or stronger opinions on, the animals, the index increases). The *upper area* relates to the gibbon whereas the *lower area* relates to the macaque. *Solid lines* denote cultural and aesthetic recognition, *dotted lines* indicate biological knowledge, and *double lines* indicate the two animals are juxtaposed in the material of this period. Supplemental text gives tips on the main data or attitudes of each stage

research while neglecting field study. I agree with this explanation, but a further question arises: why did people rely on books and documents for knowledge, yet pay little attention to the animals themselves? We may need to consider the philosophical background of ancient China. Chinese culture is, in essence, a kind of morality-featuring civilization that pursues "goodness" which is different from the "truth-seeking" culture of the West (Wang 2009). Cognitive structure in ancient times hence shows up as holistic thinking and sensibility. When it comes to identifying animals, people concentrate on their appearance, habits, or even whether their behavior is "ethical". People judged animals by ethical standards and emphasized the creature's usefulness to humans, but ignored the physical characteristics of the animals. Therefore, Chinese ancients did not care about biological distinctions between gibbons and macaques, but left many expressions on "good gibbons and evil macaques" in folklore, poems, local records, etc. These expressions provide good examples of the Chinese "goodness-seeking" culture.

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