ON INVESTIGATION OF TURKIC NUMERACY

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Abstract

Turkic culture investigation is one of the less investigated cultures in Asia. One of the reason for this that being under the Soviet Union mainly Russian orientalist were concerned with research of Turkic cultures. This is not a secret that European and American Cultural Anthropologists and Ethnography scientists did not have permission and opportunity to investigate Central Asian Countries due to restrictions of Russian orientalists. However there have been made some investigations by French and German scholars. Beside this there can be found quantity of valuable information about Turkic culture in Chinese sources. In this article we will try to find out the peculiarities of Turkic numeracy based on multiple approaches including Western and American scholars' investigation, Chinese and Russian scholars' works and some Kazakh literature as one of the representatives of Turkic culture. In spite the wide-spread concept that numbers are universal and can be regarded as linguistic unit rather than to be an object of cultural anthropology, we are proving that Turkic numeracy has specific features which require special research. By numeracy can be covered wide range of concepts such as method of traditional chronology (twelve-year cycle system), number words etymology, numerical notation, age understanding in numbers, money and trading, counting and arithmetic and etc. Whole of this concepts are being investigated now. However in this article we have included only some key points regarding Turkic numeracy in general. So here you can get some information on main features of Turkic numeracy and its investigation issues.

Keywords: Turkic numeracy, numerals, numerical notation, number symbols and anthropology of numbers

Introduction:

Numbers have been investigated from different approaches like its history of formation, its symbolic meaning, number concepts and etc. Numbers system features of different cultures including Western countries, Oriental countries, aboriginal American and some African numbers have been targets of different scholars. Stephen Chrisomalis wrote (p.2) that due to western numerical notation supremacy it was widely investigated. He points to the authors Zhang and Norman (1995), Dehaene (1997) and Ifrah (1998). Amongst non-Western scholars who have undertaken major comparative research on numeracy and mathematics he mentioned Thomas Crump (1992), David Lancy (1983), Marcia Ascher (1991) and Claudia Zaslavsky (1973). Despite works of those authors he admits that numerical notation has not been yet a primary focus of the research. We can add to this statement that numbers in Turkic nation's culture had not been object of research of Western scholars yet at all. Probably this is not case only with number concepts. As we know Turkic culture has been under interest mainly by Russian and German Orientalists. Thanks to their investigations many blank pages of Turkic history and culture have been fulfilled. Also the fact that Turkic cultural countries were under the Soviet Union encouraged Russian scientists

to investigate Turkic cultures much closer than any other regions scientists. “Needless to say, private scientific contacts with scholars in the West or in Muslim countries abroad were almost impossible outside some officially endorsed venues” (Kemper, 2011, p. 12). Along with it main sources about Turkic history were written in Chinese. We have to admit that in the 19th century Chinese culture was also one of main interests by Russian scholars. So investigation of Chinese culture was also a gate for thorough investigation of history and culture of Turkic culture in general. “The task of Oriental studies in the USSR was to provide information on Islam and Muslim societies abroad, with regard to foreign policy, and at home, in the Muslim areas of the USSR, where scholarship was crucial for the formation of national histories and identities” (Kemper, p.xiii). Along with Russian scholars German Orientalists made valuable contribution to the investigation of Turkic culture. Amongst them can be mentioned outstanding scholars such as V. Thomsen, Schott, Radloff and etc. Also Turkish scholars such as Talat Tekin and others made some inputs toward investigation of the culture.

Most of Turkish scholars were written in Turkish, hence most of them are unknown for Western scholars. Of course, there were other scholars who came originally from Central Asia and other ethnical Turkic countries. Some of them will be mentioned during the work. In spite the fact that today interest for Turkic culture raised from the end of the 20th century, it is undeniable that the main sources for Turkic culture are still from Russian and German literature. Despite the fact that main sources about Turks, for both Russian and German scholars, were taken from Chinese sources, “Chinese scholars encountered many setbacks and modern Academic branch of Inner Asia research in China began relatively late, its development was sluggish, and it was constrained by non-academic factors” (Lou Xin, 2012, p. 707). Concerning number concept in Turkic culture we can mention such scholars as Kliashtornii, Malov, Radloff, Bartold. However their work had mainly linguistic character concerning its etymology and grammar. In this work we will attempt to fulfill this gap.

Origins of Turkic Writing

‘The Turkic languages constitute a language family of at least thirty-five languages, spoken by Turkic peoples across a vast area from Southeastern Europe and the Mediterranean to Siberia and Western China, and are proposed to be part of the controversial Altaic language family (Raymond, 2005). Turkic languages are spoken as a native language by some 170 million people (http://en.wikipedia.org/wiki/Turkic_languages) and the total number of Turkic speakers, including second-language speakers, is over 200 million’ (http://www.nationsonline.org/oneworld/most_spoken_languages.htm retrieved on 22/05/2013). As you see number of Turkic language speakers is not little. Its population quantity is larger than Russian, Japanese, Korean and French language speakers as first language and it stays after Portuguese speakers with population of 176 million as native language speakers (http://digitalcommons.bard.edu/cgi/viewcontent.cgi?article=1168&context=senproj_s2011 retrieved on 23/05/2013). Turkic language speakers are mainly located in Asia. On order to trace history of formation of Turkic numerical notation we have to look to its writing system history and language formation peculiarities.

Archeological findings near Issik in Kazakhstan in 1970 showed that people settled in Central Asia had their writing system in approximately 5-4th centuries BC. Deciphering the scripts on the silver bowl showed that their forms are similar to Aramaic group of language family (http://irq.kaznpu.kz/?mod=1&tid=5&oid=268&lang=k retrieved on 05/24/2013). It proves the fact that “not only did the Hebrew and Arabic alphabets, which are used to write these other Semitic languages, derive from the Phoenician, but the entire groups of Turkish Mongolian and Persian and Indian’ (Menninger, p.263). It means that Old Turkic scripts originated from Aramaic languages and had the similar signs. Andras Rona-Tas says that Old

Turkic may be divided into two major groups: those of Semitic and those of Indic origin (Lars Johanson and Eva agnes Csato, 1998, 126). The Aramaic scripts which dates back to the 19th century BC was origin of branches like Hebrew, Palmyra, Syrian etc. However A.S. Amanzholov (2001, p. 244) suggests that Turkic writing could be formed in the result of the earliest logographic or alphabetic writing dating back to 3-2 millenniums BC. Turkic writing's close genetic interrelation with the earliest Semitic, ancient Greek, Itallic and Minor Asian letters can be explained with its long way of development which traces back to the ancient general source of alphabet scripts. However this question is beyond the issue of this work. Generally it is accepted that for Turkic scripts were used Semitic origin writing which developed in following order: Runic, the Sogdian or Uyghur, the Manichaen and the Arabic script. There have been found about 300 texts with Runic scripts. This data is very important for us, since this can help us trace the use of number signs as well.

Origins of Turkic Numerical Notation

Considering numerical notation and today's shape of number signs requires separate work to be written about this issue. There were written numerous books concerning number concept which you can find in the bibliography of this work. Anyway, this process was thoroughly investigated and written in details from its earliest periods to the time when numbers got today's shape. However, we decided that this issue is beyond of our research and decided to limit this part only with this comments. Unlike Turkic culture where numbers and numerical notation had not been yet investigated in one systematic order. Hence we decided to do this analysis as something new and can be useful for further researches in this direction.

Relying on the previous data concerned with Turkic writing we may suppose that Turkic numerals and number system was originated from Aramaic group of Semitic group of languages. According to K. Menninger: there were two forms of writing in India, the Kharoshti, which originated in the northwest and was in use only from 5th century B.C. to the 3rd century A.D. and the much more important Brahmi writing... Brahmi's underlying-principle of numeral signs was in no longer ordering or grouping; now each of the units has its own number word in the spoken language (p.394-395). This is the way how we sign the numbers. So Brahmi numbers were the first stage of contemporary number signing. Along with it they already have ten digit decimal system (Menninger, p.411). So it means that in India B.C. it was already numbers like 20, 30, 40, and etc. Can we relate those data to origins of Turkic numerals? Probably yes. Karl Menninger also referred Central Asian numerals originated from Brahmi numerals (p. 394). However Chrisomalis wrote that Brahmi and Kharoshti numerical notation systems were in competition throughout history. He pointed to Salomon's work (Salomon, 1996: 378) according to which there had been found inscriptions on stone and on copper and documents from Inner Asia. Despite wide-spread of Brahmi numerals throughout Indian continents Kharoshti survived longer in the small states of Inner Asia. However there are other group scientists who urge that Turkic numbers were naturally derived from five base system, because we have five fingers in each hand. For instance Gordlevskii stated that there is no need to try to find initial origins of number system from other neighboring cultures, since this system was naturally established because of five fingers. Later this system developed to ten numbers. This hypothesis will be considered further in analysis of Turkic number etymology.

In the next stage of numeral system wide spread in the Central Asia was Sogdian writing system and probably sogdian numerical notation system. Fortunately, there were made some researches concerning Sogdian numerical notation by Chrisomalis. He wrote that the Sogdian script is first attested from the "Ancient Letters" dating to AD 312-313 found by Stein in Chinese Turkestan but may have originated in the third century (p. 87). He underlined that there has been no systematic comparative treatment of Sogdian numerals to date, and minimal paleographic work and further he gives signs for numerals 1, 10, 20 and hundred. He

described numerals cumulative additive to 100 which means that this system was similar to Classical Roman numerals where many signs per power of the base, which are added to obtain the total value of that power. For example for 34= XXXIIII which is (10+10+10)+(1+1+1+1). But hundreds and thousands were multiplicative when two components per power, unit signs and a power-sign, multiplied together, give that power's total value. For example number 1434=(1*1000+4*100+3*10+4). Unfortunately, there is not special epigraphic investigation toward numerals of the Sogdian numerals and it was fallen out of use by the tenth century.

Anyway knowledge of origin of Turkic numerals being from Aramaic gives us general following information concerning this system. First is that it has decimal base. Second there is a special sign for 2o. Third, the use of vertical strokes for units and horizontal strokes for tens. Fourth a cumulative-additive structure for numbers smaller than ten and the use of multiplicative-additive notation for expressing multiplies of 100. This analysis was taken from Chrisomalis (p.92). Unfortunately there were found no documents or stone scripts from Central Asia and Mongolia with number signs. In all stones scripts number were given lexically. This was pointed by Chrisomalis either. He underlined that numbers were often written out lexically in religious and literally contexts and even occasionally in economic documents and their imprint was impermanent. (p.92). Indeed amongst the Russian Orientalists works dedicated to Turkic ancient scripts there was not mentioned any signs for numbers. Despite the fact that the earliest script was totally encrypted by Thomsen and there had been conducted several thorough epigraphic investigations, which will be discussed in the following part of the work, there was no mension about number signs. However numbers, chronology methods, etymology of number-words were one of the main concerns for several scientists like Gordlevskii, Kilastornii, Thomsen etc. We think that this lack of information concerning number signs was because of simple reason that there were no number signs in those scripts. Chrisomalis also wrote: "we simply do not know by what means the users of these script traditions performed arithmetic , but there is no reason to assume that it was done with pen and paper' (p.92). This statement led us to try to find traces of counting boards amongst Turkic people which will be considered in corresponding chapter.

After this period we can notice numbers as signs after Islamic began spreading from 8th century. Numbers in that period were written with Arabic number signs. This period lasted till 1929th year, when in Kazakh Autonomous Soviet Social Republic it was replaced with Latin alphabet. From that time till now number signs which we use today was introduced and began to be in use.

This is only the chonology order of Turkic numeracy in the Central Asia. However we should take into into account that this is only the beginning of Turkic numeracy system. As it was mentioned above numerals covers such areas of life as arythmetics, money and trade, date chronology, astrology understanding of age and etc. Further analysis requires deeper knowledge of culture of Turkic culture and intorduction with Chinese, Russian, and Western literature. In further our researches we are aiming to do contribution to this aspect of Turkic numerical notation.

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