Were Baby Girls More Likely To Be Killed For Birth Control In Pre-Modern Asia? : Evidence from Colonial Korea

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1. Introduction

Murder of a newborn baby by his or her parents appears frequently in myths, fairy tales, or old stories all around the world. Historical demographers have regarded these cruel episodes as reflecting prevalence of infanticide and inferred that it was a desperate reaction to extreme poverty or great famine. About two decades ago, however, a group of scholars studying pre-modern Chinese demography started to propose that infanticide was committed in China not as a positive check but as a preventive check; people in late Qing Dynasty deliberately killed newborn babies in order to avoid potential catastrophe from high population pressure.¹

Noteworthy is that these revisionists corroborated their argument by showing the “unnatural” high sex ratio; by comparing the sex ratio from their data with that from the model life table, they inferred that female babies were discriminated in infanticide and ultimately claimed the new interpretation of Chinese population history. Since then, this argument has been popularly referred as a stylized fact characterizing the pre-modern Asian demography. For example, Massimo Livi-Bacci mentioned that “infanticide was mainly committed to female babies”. Gregory Clark, in explaining the birth rate of China, argued that female infanticide “was consciously and deliberately practiced”.²

The sex-biased hypothesis of infanticide, although elaborately proposed and widely adopted, has serious weaknesses. Theoretically, their argument relies on some implausible assumptions. More problematic is the fact itself; according to their description, the high sex ratio is likely to come from data processing rather than the reality. For better understanding of pre-modern Asian demography, we need a firmer empirical foundation on this phenomenon.

We, therefore, explored the sex ratio of babies infanticided in Colonial Korea (1910-1945). Pre-modern Korea had conditions that the sex-biased infanticide might occur as much as China. More important is availability of a good data. Instead of inferring about the sex-bias of the infanticide indirectly from the age structure of the population, we can explore more direct evidence, that is, the records of infant corpse that were found on the street.

In the following, we will review the historiography (Chapter 2), introduce the data

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(Chapter 3), and then provide the estimation result (Chapter 4). After discussing about what implications the selective infanticide of pre-modern Asia have on understanding selective abortion after the introduction of the ultrasound test (Chapter 5), we will sum up the whole discussion and conclude (Chapter 6).

2. A Critical Review of Literature

(1) Infanticide as a Preventive Check

In *An Essay on the Principle of Population*, Thomas Malthus proposed important concepts and arguments that have guided and framed the subsequent studies of population. One of Malthus’ conjectures especially influential to historical demographers is about what determined the pre-modern population. After distinguishing the preventive check and the positive check as factors of population control, he suggested that the preventive check rarely work in pre-modern societies. This argument came from his belief that “the passion between the sexes” makes people bear children constantly at a high level. The size of population, instead, is decided by the positive check; as the growth of food production cannot be as fast as population growth, the death of people due to hunger and poverty adjust the size of population.\(^3\)

Malthus’ conjecture on the dominance of the positive check in the pre-modern societies has been examined by many scholars. It is, however, E.A. Wrigley and R.S. Schofield who performed a monumental test and made a watershed in this historiography. From analyzing massive parish register records of England from the mid-16\(^{th}\) century to the eve of the Industrial Revolution, they characterized the pre-modern England as “a fertility-dominated low-pressure system”. This result refutes Malthus’ conjecture; the preventive check rather than the positive check turns out to be the key determinant of the English population.\(^4\)

David Weir succeeded to Wrigley and Schofield’s critique on the Malthus’ conjecture. His prime concern was to evaluate Wrigley and Schofield’s contrast between England and France. However, by showing that Old Regime France was also a low pressure society where the preventive check functioned effectively, he ultimately contributed to weakening

\(^3\) Malthus (1985). The quotation comes from p.70.

\(^4\) Wrigley and Schofield (1981), and the quotation comes from p.451. Schofield (1986) manifested explicitly that the key research agenda of Wrigley and Schofield (1981) is on the test of Malthus’ argument.
Malthus’ postulation of pre-modern demography.\(^5\)

The work of James Lee, Cameron Campbell, and Wang Feng marked a culmination at this revisionist movement. China has been generally regarded as the last place where the preventive check effectively reduced the population pressure. Malthus also asserted a similar idea in *An Essay*.\(^6\) In their study on the fertility and mortality of Qing nobility and a rural village in 19th-century Liaoning, however, these revisionists claimed that even in China birth side control was deliberately performed.\(^7\)

Noteworthy is that the revisionists proposed an additional mechanism that Wrigley and Schofield or Weir did not explore systematically. Whereas the previous studies focused on nuptiality and birth interval, they proposed that in China infanticide was an additional mean to lower population pressure. Rather than as a desperate response to famine, people murdered new born babies as a precautionary deliberate control in order to avoid catastrophe. As infanticide is a control through death, they analyzed it under the title of the positive check.\(^8\) However, they implied in their discussion that the deliberate infanticide was a *de facto* preventive check.

Rather independent of this historiography, scholars studying population history of Japan have long paid attention to *Mabiki* (the Japanese word of infanticide). By referring these studies, Hiroshi Kito inferred that infanticide was widely implemented to lower the family size in Japan before the industrialization.\(^9\) In sum, the studies of Japanese demography together with China contributed to redefining the infanticide as a precautionary device.\(^10\)

(2) Sex-Biased Infanticide in Pre-Modem Asia

A proposition coupled with this novel interpretation of infanticide as a preventive check is that female babies were discriminated in the infanticide. By comparing with the model life table proposed by Coale and Demeny (1983), Campbell, Lee, and Wang claimed in their works that large number of missing female babies could not be explained without

\(^{5}\) Weir (1984).
\(^{6}\) Malthus (1826), Ch.XII. Requoted from Zhao (1997), pp.729-730.
\(^{8}\) The title of the chapter discussing the infanticide is “Two types of positive check: infanticide and neglect”. Lee and Campbell (1997), Ch.4.
\(^{9}\) Kito (2006), pp.216-222.
\(^{10}\) Saito (1992) warned that the infanticide might not be so prevalent as the scholars suggested.
infanticide.$^{11}$

For further discussion, it is helpful to formalize the sex-biased hypothesis of infanticide. If we define the sex ratio ($R$) as

$$R = 100 \times \frac{N^m}{N^f} \quad \text{-------- (1)}$$

$N^i$: the number of people, $i=m$ if male, $i=f$ if female

the sex-biased hypothesis of infanticide can be presented as

$$\bar{R} > R_{\text{infanticide}} \quad \text{-------- (2)}$$

$\bar{R}$: the lower bound of the natural sex ratio of newly born babies

$R_{\text{infanticide}}$: the sex ratio of murdered babies in a society

According to Formula (2), the revisionists adopted the sex ratio of the model life table by Coale and Demeny (1983) for $\bar{R}$, and estimated $R_{\text{infanticide}}$ from their sources.

One thing to be emphasized is that the revisionists didn’t propose the selective infanticide simply as a corollary from the prevalence of infanticide. On the contrary, they utilized the hypothesis for corroborating the precautionary infanticide itself. For example, the registration record of the banner villages in Liaoning that they analyzed does not provide direct evidence on the infanticide. Even for information on the babies, records of those whose life was recorded from their birth was quite small and incomplete.$^{12}$ The imbalance between male and female babies was used as the evidence for supporting their inference. In sum, the revisionists used sex-biased infanticide as the evidence of precautionary infanticide, and ultimately their reinterpretation of Chinese demography.$^{13}$

[Scholars studying Japanese demography mentioned the high sex ratio.$^{14}$]

$^{11}$ See footnote 7.

$^{12}$ In depicting the data they analyzed, Lee and Campbell referred that almost no one about below one year old (2 sui in their words) is recorded in the register. Lee and Campbell (1997), p.69, footnote 22; p.231 in Appendix A.

$^{13}$ Lee and Campbell (1997). Lee, Wang, and Campbell (1994) also applied the same approach in analyzing nobility of Qing Dynasty and derived a similar result.

$^{14}$ However, Cornell (1996) and Saito (2006) raise suspicions to this view.
(3) Problems of the Hypothesis

Although popular, the sex-biased hypothesis of infanticide has some serious weaknesses. Theoretically, it is hard to think of a spontaneous mechanism that generates a high sex ratio as a long-term stable equilibrium. For example, in a society where the share of male is excessively higher due to removal of female babies, the relative economic or social value of women should go up and it will reduce parents’ incentive to “deliberately” remove female babies. It means that the sex-biased hypothesis cannot stand without implausible behavior of parents, that is, parents consider the social welfare as a whole and coordinate in deciding whether their newborn babies should be abandoned.\footnote{This critique is basically in line with what Weir (1984) claimed in criticizing the Malthusian theory.}

[More questionable is the high sex ratio itself. As the data does not contain enough records of infants, the revisionists inferred from the sex ratio of the whole population in data, and then inferred on the causes of early death. However, there are couples of reasons why women registered less than men and the sex ratio reflected on the record can be a statistical artifact rather than a reality.]

Some scholars might want to make more effort to think of logic justifying a long-term demographic equilibrium with high sex ratio, or explaining that the discrepancy between actual sex ratio and the estimated one is negligible. However, more productive alternative would be to find a better data rather than adopting their finding as a stylized fact. A reliable estimate of sex ratio of infanticided babies can help enhancing our understanding on pre-modern demography.

3. Data

We explore the sex-biased hypothesis of infanticide using a data from colonial Korea. Korea is a good candidate for exploring this hypothesis. First, population pressure of pre-modern Korea does not seem to be far lower than any other Asian countries. Second, in Korea, girls were very likely to be discriminated in infanticide if it happened. For last three hundred years from the beginning of the 18th century to the 1990s, Korea has maintained a strong boy preference.\footnote{Deuchler (1992) and Peterson (1996).} In sum, pre-modern Korea satisfies conditions that could cause sex-biased infanticide for lowering population pressure like China.
More important is that Korea has a good data on infanticide. We analyzed record of the Haengryu deceased. When an accidental death occurred, the police investigated identity of the dead and the cause of death. If the police figured out the identity and found his or her families, then the corpse would be handed to them. Otherwise, that person was classified as the Haengryu Deceased in Korea. The majority of the Haengryu deceased were beggars, addicted, or outcast like lepers, and they did not have families or acquaintances at all within reach. However, as not a small share of them died due to unexpected misfortune like drowning or railroad accident, the Haengryu deceased cannot be named simply as “homeless” or “vagabond”.

Compared to the data the revisionists used, the record of the Haengryu Deceased has several advantages. First, it is a record of death. Second, it has larger number of records than the data the revisionist used. Last and the most important is that it can provide a good measure of the sex ratio. It is hard to think of reasons why murdered boys were more exposed than murdered girls, vice versa (Figure 1). It means that the sex ratio of the infants recorded in Haengryu Deceased record is a good measure of the population sex ratio infanticided. In other words,

\[
E(R_{\text{infanticide}}) = R_{\text{Haengryu}} \quad \text{(3)}
\]

In sum, as the number of infant corpse found on the street should be much smaller than the total occurrence of infanticide, it cannot be used for measuring how prevalent the infanticide was. However, the sex ratio of infants from the Haengryu deceased data should be a good estimator of the actuality.

4. Estimation Results

Before exploring the Haengryu Deceased data, we examine the age structure using Census. Table 1 shows the sex ratio of infants from the census. It was below 105 during the colonial period. There is no excess male infant in Colonial Korea, which implies no inkling of infanticide.

Let us examine more direct evidence. Table 2 shows the sex ratio of infants recorded in the Haengryu Deceased register. The sex ratio was 104-105, which is quite normal level.

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17 Data description below came from Kim and Park (2009) with some revision.
This contradicts the sex-biased hypothesis of infanticide.

[As the revisionist view centers on the infanticide as preventive check, it is about the long term average level of sex ratio. However, it is worth checking how the selectivity of the infanticide responded to economic fluctuations.]

5. Selective Abortion and Selective Infanticide

Before finalizing, one aspect worth discussing is the implication of the hypothesis in interpreting the selective abortion of modern Asia. From the early 1980s when ultrasonic test for fetus became popular, this technology has been used as a tool for selective abortion in some Asian countries with strong boy preference. As a result, the sex ratio of infants in China, India, and Korea increased sharply due to removal of female fetus (Figure 2). 18

One reason why the sex-biased infanticide hypothesis is widely accepted seems to be the similarity between the past and the present. Lee and Campbell (1997) recognized this relation. They called infanticide as post-natal abortion, and considered the selective abortion from a continuation from the pre-modern societies.

Therefore, to accept or to reject the sex-biased hypothesis of infanticide has an important meaning in interpreting the selective abortion of the modern period. For showing the meaning, it is useful to consider a counterfactual. What would have been the sex ratio if the technology did not appear in the early 1980s? Lee and Campbell imply that the impact of technology for the “missing women” might be small. Even without the technology, they should have been killed at all right after the birth. However, the opposite means that if the machine had not appeared, the sex ratio should have remained at a much lower level. The latter implies that the technology changed human behavior, and the prohibition of using the machine, if effective, can lower the number of “missing women”.

The Korean data belies the implication from the revisionists’ view. This strong boy preference were realized when the ultrasonic test became prevalent (Figure 2). The sex ratio of new born babies increased up to 115 Before this technology was not available, people could have committed infanticide against the girl, and the sex ratio of the murdered babies should be much lower than natural sex ratio.

18 Scholars debated on how much can be explained by the selective abortion. However, all of them agree that selective abortion is pervasive. See Sen (1990), Oster (2005).
6. Conclusion
[To be written]

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Lee, James and Cameron Campbell, Fate and fortune in rural China: social organization and population behavior in Liaoning, 1774-1873 (Cambridge University Press, 1997)
Peterson, Mark, Korean adoption and inheritance: case studies in the creation of a classic Confucian society (Cornell Univ East Asia Program, 1996)
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19 SNU 사회과학도서관 서고 304.6 L76s 2007
Figure 2 Sex Ratio at Birth: South Korea, 1970 - 2009

Sources: Statistics Korea (2010), p.36.
### Table 1 The Sex Ratio of Infants from the Census, 1930-1940.

<table>
<thead>
<tr>
<th>Age</th>
<th>Year</th>
<th>1930</th>
<th>1935</th>
<th>1940</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>101.5</td>
<td>103.6</td>
<td>103.6</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>102.3</td>
<td>102.5</td>
<td>101.7</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>102.0</td>
<td>102.2</td>
<td>101.8</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>102.9</td>
<td>103.9</td>
<td>102.7</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>104.2</td>
<td>103.2</td>
<td>103.5</td>
</tr>
<tr>
<td>0-4</td>
<td></td>
<td>102.5</td>
<td>103.1</td>
<td>102.7</td>
</tr>
</tbody>
</table>

Source: Government-General of Colonial Korea

### Table 2 the Sex Ratio of Infants Recorded as the *Haengryu* Deceased (in Progress)

<table>
<thead>
<tr>
<th>Age (0-12 Months)</th>
<th>Below 1 Month</th>
<th>1-6 Months</th>
<th>7-12 Months</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>90</td>
<td>85</td>
<td>91</td>
<td>266</td>
</tr>
<tr>
<td>Male</td>
<td>47</td>
<td>46</td>
<td>43</td>
<td>136</td>
</tr>
<tr>
<td>Female</td>
<td>43</td>
<td>39</td>
<td>48</td>
<td>130</td>
</tr>
<tr>
<td>Sex Ratio</td>
<td>109.3</td>
<td>117.9</td>
<td>89.6</td>
<td>104.6</td>
</tr>
</tbody>
</table>

Source: See the text.