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HEIGHT AND WEIGHT DIFFERENCES BETWEEN NORTH AND SOUTH KOREA

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Summary. This paper investigates height and weight differences between the two Koreas by comparing national anthropometric data published by the South Korean Research Institute of Standard and Science with United Nations survey data collected inside North Korea in 2002. For socioeconomic reasons, pre-school children raised in the developing country of North Korea are up to 13 cm shorter and up to 7 kg lighter than children who were brought up in South Korea – an OECD member. North Korean women were also found to weigh up to 9 kg less than their Southern counterparts.

Introduction

History provides some natural experiments for measuring socioeconomic disparities among a homogenous people. For instance, adult East Germans have been found to be about 1 cm shorter than West Germans (Komlos & Kriwy, 2001). The most illustrious example of a politically divided homogeneous nation is certainly Korea's partition into South and North following World War II. Nowadays, the southern and democratized part of the peninsula is an OECD member country and one of the world's top economies. In contrast, as a consequence of communism, North Korea is a developing country largely characterized by a lack of economic growth and national famines (Table 1). Interestingly, prior to the separation of the nation, North Korean adults were between 1·1 and 1·4 cm taller than their southern counterparts (Kimura, 1993). What does anthropometric evidence suggest today? Several reports have attempted to provide evidence on this matter. Pak (2004a) compared the heights and weights of North Korean defectors with South Korean heights and found a height gap of 5·9 and 6·6 cm for male and female young adults, respectively. Moreover, 20- to 50-year-old North Korean female refugees were found to weigh 51–55 kg (Pak, 2004b). The South Korean Center for Disease Control and Prevention reports that 20- to 39-year-old North Korean refugees seem to be 7 cm shorter than the average South Korean (Frankfurter Allgemeine Zeitung, 2006). According to South Korean officials, North Korean children lag 10–15 cm behind their South Korean counterparts in terms of stature (Yonhapnews, 2006). However, all these reports are based on North Korean refugees measured in South Korea.

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Table 1. Selected social indicators for the two Koreas

Social indicator	North Korea	South Korea	Source
Status of freedom, 1989–2003	Not free	Free	Freedomhouse.org
Maternal mortality ratio, 1980–1999[a]	110	20	UNICEF (2001), p. 103
Under-5 mortality rate of children, 1999	30	5	UNICEF (2001), p. 79
GDP *per capita* in US$, 2002	1420	17,133	Penn World Tables 6·2
Daily calorie consumption in kcal *per capita*, 2001–2003	2160	3040	FAO (2006), p. 190
Daily protein consumption in g *per capita*, 2001–2003	63	89	FAO (2006), p. 190
Daily fat consumption in g *per capita*, 2001–2003	35	78	FAO (2006), p. 190

[a]Deaths of women from pregnancy-related causes per 100,000 live births.

This paper investigates height and weight differences between the two Koreas – here for the first time by making use of non-refugee data. The aim of this article is to investigate the current socioeconomic differences between the two Koreas as indicated by the weights and heights/lengths of children and weights of women.

Data

Data for this study were provided by United Nations survey data. In 2002, the height and weight of 2880 boys and 3112 girls under seven years of age were collected in randomly selected North Korean households (CBS, UNICEF & WFP, 2002). Height/length and weight were measured by making use of standard anthropometric measures recommended by the United Nations (UNICEF electronic scales by SECA and height/length boards by SHORR), and at least two field researchers per team carrying out the anthropometric measurement. Note that this survey has been reviewed extensively elsewhere (Schwekendiek, 2006). One shortcoming of the survey is that some regions (and thus households in these regions) were declared inaccessible due to security concerns by the North Korean military. Yet, only 3·5% of the sampled individuals had to be replaced because of inaccessibility issues in ten out of twelve North Korean provinces. Therefore, although the survey is not fully representative of the country, there only seems to be a small bias caused by the imposed sampling restrictions. Furthermore, an often held reproach is that the North Korean officials could have manipulated the implementation of the survey. Yet, all field teams carrying out the survey were monitored by international staff, and even the drivers were employed by the United Nations. In addition, the weights of 2803 women over 20 years of age were recorded. However, note that the womens' sample is only based on mothers (of survey-selected children under two years of age). As these mothers are likely to have still been breast-feeding or may not have fully recovered from their pregnancy, the weight gap could be slightly distorted when comparing them with South Korean women.

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Table 2. South Korean–North Korean anthropmetric differences, 2002/2003

	Height/length of males in cm					Height of females in cm					Weight of males in kg					Weight of females in kg				
	North Korea		South Korea			North Korea		South Korea			North Korea		South Korea			North Korea		South Korea		
Age (years)	Mean	SD	Mean	SD	SK–NK gap	Mean	SD	Mean	SD	SK–NK gap	Mean	SD	Mean	SD	SK–NK gap	Mean	SD	Mean	SD	SK–NK gap
Boys and girls																				
0·00–1·49	68·9	6·0	70·5	3·4	**1·6**	67·45	5·7	68·6	3·2	**1·2**	7·8	1·6	8·8	1·5	**0·9**	7·4	1·4	8·0	1·0	**0·6**
1·50–2·49	80·1	3·7	87·8	4·4	**7·7**	79·2	3·7	86·4	4·9	**7·2**	10·3	1·1	13·2	1·7	**2·9**	9·9	1·2	12·5	1·8	**2·6**
2·50–3·49	87·0	4·1	95·2	4·0	**8·2**	86·2	4·0	94·4	3·9	**8·2**	12·0	1·4	14·8	1·6	**2·8**	11·6	1·3	14·3	1·6	**2·7**
3·50–4·49	94·7	4·3	102·3	4·1	**7·6**	93·4	4·4	101·1	4·1	**7·7**	13·8	1·4	16·7	2·3	**2·9**	13·2	1·4	16·1	2·0	**2·9**
4·50–5·49	101·0	4·3	109·0	4·7	**8·0**	99·7	4·3	107·9	4·4	**8·2**	15·3	1·4	19·1	2·9	**3·8**	14·6	1·3	18·3	2·3	**3·7**
5·50–6·49	106·7	4·2	115·5	4·6	**8·8**	105·7	4·7	114·6	4·5	**8·9**	16·9	1·4	21·5	3·2	**4·6**	16·3	1·7	20·9	2·9	**4·6**
6·50–7·49	109·3	4·7	122·0	4·8	**12·7**	108·1	4·2	120·5	4·8	**12·4**	17·6	1·6	24·9	4·5	**7·3**	16·9	1·7	23·3	3·7	**6·4**
Women																				
19·50–24·49																49·8	5·5	53·5	7·1	**3·7**
24·50–29·49																49·6	5·1	54·8	7·5	**5·2**
29·50–34·49																49·5	5·1	55·2	7·6	**5·7**
34·50–39·49																49·9	5·3	57·1	7·8	**7·2**
39·50–49·49																48·5	7·3	57·4	7·1	**8·9**

Notes: 0·50 and 0·49 cut-offs for age groups were taken because common 0·00 and 0·99 age groups classifications were not reported in the South Korean survey (Korean Research Institute of Standard and Science, 2004). SD=standard deviation, SK=South Korea, NK=North Korea.

Table 3. Weight in kilograms of North Korean women

Age group	North Korean refugees from 1999 to 2003[a]	North Korea in 2002
20s	51·49	49·70
30s	51·89	49·70
40s	54·77	48·50

[a]Figures reported in Pak (2004b). Based on 1194 North Korean refugees weighed on their arrival in South Korea.

In this study, the North Korean data are related to a nationally representative survey of South Koreans that was carried out by the Korean Research Institute of Standard and Science (2004) as early as 2003. Heights/lengths were collected from 1649 boys and 1646 girls, and weights from 1648 boys and 1646 girls under seven years of age. Women's weights were based on 1839 individuals.

Findings and Discussion

The height/length and weight differences of pre-school children are illustrated in Table 2. For boys, a minimum of 2 cm and a maximum of 13 cm in height difference is detected, and 1 to 12 cm for girls. As for weight, the minimum and maximum for male and female weight differences are 1–7 kg and 1–6 kg, respectively. As seen in Table 2, these South–North disparities seem to become more pronounced in older age cohorts.

Furthermore, South Korean women seem to weigh 4–9 kg more than Northern females on average, where again differences become more pronounced in older age groups. Compared with a previous refugee report (Pak, 2004b), mothers living inside North Korea seem to be lighter than North Korean females who defected to South Korea (Table 3).

As North and South Koreans are genetically the same people, these anthropometric gaps seem largely be a manifestation of the socioeconomic differences between the two Koreas: in 2002, GDP *per capita* was estimated to be twelve times greater in South Korea (Table 1). It is probable that these large differences are primarily due to nutrition (see Table 1). For instance, according to the United Nations Food and Agricultural Organization, protein and calorie consumption is 1·4 times higher, and fat consumption 2·2 times higher for South Koreans (Table 1).

In conclusion, after World War II, the two Koreas underwent diametrically opposed political transformations. Before the partition of the peninsula, Northerners were even slightly taller than Southerners. Nowadays, the situation has reversed for socioeconomic reasons. Pre-school children raised in the developing country of North Korea are up to 13 cm shorter and up to 7 kg lighter than children who were brought up in South Korea – an OECD member. North Korean women have also been found to weigh up to 9 kg less than their Southern counterparts.

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