Article

Korean Living Standards under Japanese Colonial Rule: A Critical Review of the Longitudinal Trajectory of Stature*

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Introduction

Korean living standards during the colonial period (1910-1945) became a highly controversial topic in South Korea in recent decades. Nationalist and Marxist historiography that characterized the modern history scholarship in South Korea throughout the latter half of the twentieth century commonly acknowledged that Koreans underwent a decline in living standards under Japanese colonial rule. Such an understanding did not change even amongst the fundamental reevaluation of the significance of the colonial period by international scholars from the mid-1980s who traced South Korea's developmental success to its experience of Japanese colonialism. However, from the mid-1990s, a group of South Korean economic historians centered at the Naksungdae Institute completely reversed traditional narratives of suffering and exploitation and argued that Koreans during the colonial period became better off. Their arguments are backed by an extensive reconstruction of the national accounts of the colonial period accumulated amidst the recent "cliometric revolution" in the study of Korean economic history (Kim and Park 2012). Indicators of living standards such as food consumption and real wage, which were previously estimated to have decreased or stagnated over the colonial period, were now argued to have stagnated or even increased. Its quantitative rigor notwithstanding, the revisionist thesis that even the Korean masses became better off under Japanese colonial rule still faces significant opposition among historians. Commonly coupled with ideological or political orientations, these opposing views on Korean living standards during the colonial period persist with meager signs of resolution or reconciliation.

This paper contributes to the current debate on Korean living standards through a critical review of past works on Korean stature, which has been widely employed by recent revisionist literature in conjunction with national accounts as an evidence for improving living standards. The results obtained from the review of stature will be juxtaposed to trends in other representative indicators of biological living standards of the general populace, namely, wage, food consumption, and inequality. I will conclude the article with an interpretation of these historical statistics with regard to Korean living standards under Japanese

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colonial rule. In order to present the trajectory of living standards during the colonial period in its larger historical background, I will set the temporal scale of my analysis to include the decades immediately preceding and succeeding the colonial period.

Stature

Past studies on Korean height during the colonial period produced diverging estimates and interpretations. Scholars writing about Korean living standards during the colonial period have selectively referred to estimates of Korean height that conform to their own hypotheses while ignoring or dismissing without sufficient justification ones that do not (for example, see Cha 2012, 342). In this section, I will conduct a comprehensive review of past works on Korean stature during the colonial period and suggest a reasonable estimate of its historical trajectory.

Kimura (1993, 644-47) examined the trajectory of Korean height from several sets of fragmentary measurements during the colonial period and concluded that there was no significant change in the stature of the Korean masses. Kimura's analysis provided limited information since all height data were obtained from one-time measurements of diverse small-size samples that can only very roughly be controlled for class and region. In order to have a more reliable estimate of height trends, we need large time-series data from a consistent sample, which Kimura could not find in his early research.

The first and the hitherto most comprehensive time-series data on Korean height during the colonial period were the insurants' and dependents' height data from the Korea Medical Insurance Corporation (KMIC) first presented by Gill (1995, 1998).[1] The insurants' heights were measured twice in 1990 and 1994, and the dependents' heights were measured once in 1993.[2] The data sets contained ample numbers of people born during the colonial period, but the measured heights could not be used at face value because human height shrinks

1. KMIC is an organization in South Korea that offers health insurance to "all civil employees, school teachers and their dependents" (Gill 1998, 123).
2. The insurants were the insured civil employees and school teachers.

with old age.

To eliminate the effect of height shrinkage, Gill calculated height differences between identical age groups measured in 1990 and in 1994. The negative value for the year 1932 in Figure 1 indicates that the average height of 62-year old males measured in 1994 (i.e., born in 1932) is shorter than the average height of 62-year old males measured in 1990 (i.e., born in 1928). Doing the same calculation for all available 4-year birth intervals in the insurants' sample showed that male average height decreased since the birth cohorts of the mid-1920s (namely, starting from the 4-year interval of 1924-1928) until around independence, and started to rise from circa 1950 (starting from the 4-year interval of 1948-1952). Height trends in the birth cohorts before the mid-1920s could not be examined this way because of few or nonexistent measurements in the insurants' sample. The sudden reversal from a positive to a negative trend in the mid-1920s indicated in Figure 1 might be due to small samples, although the positive values of the mid-1920s do point to the possibility that average height may have been increasing in the early colonial years. Overall, Gill's research strongly suggests that average height decreased from the birth cohorts of the mid-1920s until the Korean War (1950-1953) and embarked on a sustained increase thereafter. However, in order to find out the trend before the mid-1920s, one would need to look at other sources including the KMIC dependents' sample that contains a large number of measurements of earlier birth cohorts. Unfortunately, Gill's method for eliminating height shrinkage with age could not be applied to the dependents' sample because their heights were measured only once.

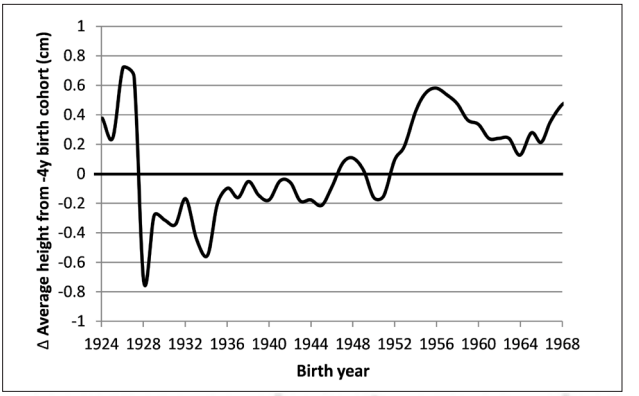

Figure 1. Change in KMIC Male Insurants' Height
Source: Graph re-drawn from Gill (1995, 323)

Gill's KMIC height data were subsequently analyzed by Choi (2006), Joo (2006), and Choi and Schwekendiek (2009). Choi (2006) used the 1993 dependents' height sample to examine the birth cohorts of the entire colonial period. Choi (2006) used a height shrinkage function that he constructed from various contemporary medical sources.[3] The resulting trajectory of Korean height drew an inverse U-shape curve from the late nineteenth century until the end of the colonial period with its peak at the birth cohort of 1926—a finding largely consistent with Gill's analysis of the trend in insurants' height. Choi (2006) applied the same adjustment to the 1990 and 1994 insurants' height sample and came up with a similar yet more pronounced trend of decreasing height since the mid-1920s until shortly after independence. Choi (2006) complemented his findings with various other sources including samples from Korea Industrial Advancement Association (KIAA) and Seodaemun prisoners' account, none of which has the level of reliability as the KMIC data set. The Seodaemun prisoners' account helped draw the left side of the hypothesized inverse U-shape curve by showing an increasing trend since the birth cohorts of the mid-1880s up to the mid-1910s, although the reliability of this sample was reduced by small size and a potential sampling bias.

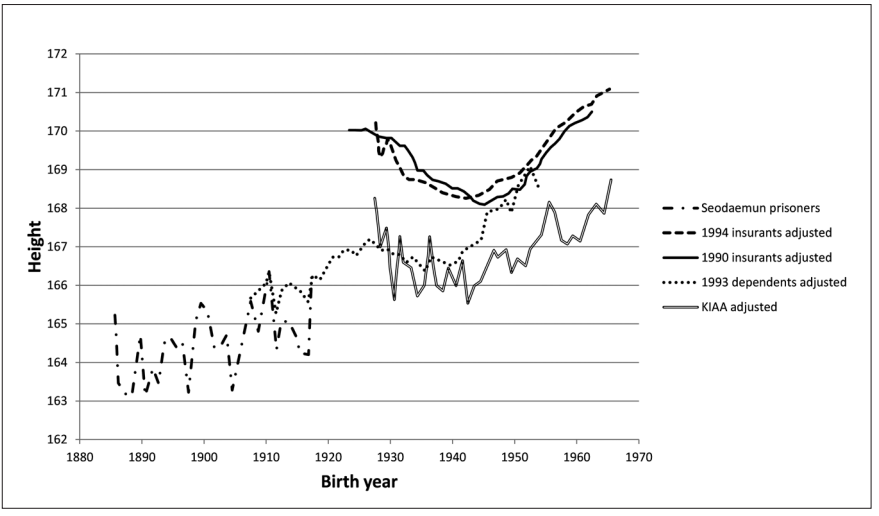

Figure 2. Male Height Trends in Choi (2006)
Source: Graph re-drawn from Choi (2006, 70)

3. See Choi 2006, 65-66 for details.

In contrast to Choi (2006) whose results were largely consistent with Gill (1995), Joo (2006) rejected Gill's argument that average height decreased from the birth cohorts of the mid-1920s. Instead of refuting Gill's analysis of the insurants' height data, Joo analyzed the 1993 dependents' height sample and concluded that Korean average height by birth cohort increased slightly yet continuously throughout the colonial period. However, Joo (2006) used an overly simplistic and arbitrary assumption of a height shrinkage rate of 0.4 cm every 4 years, which critically weakened the plausibility of his analysis.

Choi and Schwekendiek (2009) used three main data sets, namely the previously-analyzed KMIC 1993 dependents' height data and Seodaemun prisoners' register, plus a new data set from Korean Agency for Technology and Standards (ATS). As in Choi (2006), the KMIC data provided the most comprehensive statistical coverage. The ATS data set is available only in annual averages and has a relatively small sample. The most important difference of Choi and Schwekendiek (2009) from Choi (2006) is in the function for estimating height shrinkage with aging. This time, the function was taken from a well-known research by Cline et al. (1989) that derived a height shrinkage function through empirical anthropometric research. The result, instead of an inverse U-shape curve previously estimated in Choi (2006), was a trend of continuous increase throughout the colonial period (see Figure 3).

The above review of past literature reveals that the KMIC insurants' and dependents' height data have been the only reliable time-series data used by all studies on Korean stature (the relatively recent paper by Kim and Park is an exception, which will be discussed shortly below). In particular, the 1993 dependents' height data received a lot of attention as it covers the entire colonial period with minimal class bias. However, the problem with the 1993 KMIC dependents' sample is that the estimation of height varies widely depending on the function used to adjust for height shrinkage (see Figure 3). One must admit the difficulty at this point to give full credibility to a certain function since no information is available on how fast the KMIC dependents' heights decreased with age despite various authors' attempts to apply a reasonable adjustment. For example, the height shrinkage function in Cline et al. (1989) used by Choi and Schwekendiek (2009) was calculated from samples in twentieth-century Arizona and most likely underestimated the magnitude of height shrinkage in the KMIC samples since the statures of populations with lower living standards tend to shrink in a steeper curve than the those with higher living

standards. Choi and Schwekendiek's argument that Korean average height grew continuously throughout the colonial period was likely a result of an underestimation of the degree of height shrinkage of the early birth cohorts in the KMIC dependents' sample.

Other height shrinkage functions currently available in the academic literature do not offer any reliable height adjustment for Koreans under Japanese rule either. The height shrinkage function presented by Chandler and Bock (1991) was based on samples from Western Australia measured in the latter half of the twentieth century, which in fact shows a steeper rate of height shrinkage than Cline et al. (1989). A better candidate would be the functions presented by Morgan (2009) constructed based on the height data of Canton Chinese immigrants in Western and Southern Australia measured in the former half of the twentieth century. However, even these Cantonese-Australians likely had higher biological living standards than the average Korean under Japanese colonial rule, especially considering the fact that they all belonged to the group of Chinese immigrants who could afford to make multiple trips to China. The statistical difficulty of processing the height data induced Morgan to come up with two significantly different height reduction functions, which also reduces the prospect of any naïve application to our case in colonial Korea (see Figure 4 in Morgan 2009 for a visual comparison of different height shrinkage functions).[4]

4. My analysis would have been made visually more appealing if these height shrinkage functions could be applied to the original KMIC male dependents' height data and compared side-by-side in a graph similar to Figure 3. The actual trajectory of the KMIC dependents' height by birth cohort would have reflected a larger degree of adjustment for older samples than any of the existing height adjustment functions that were derived from populations with higher living standards (and thus would have made the decrease in height since the 1920s quite pronounced as is visible in the KMIC insurants' sample). My failure to retrieve the original data file (which, to the best of my knowledge, was never published anywhere) prevented me from undertaking such an analysis. Professor Gill is no longer academically active and apparently not in a situation to be contacted, and I failed to retrieve it from the several authors who had obtained the data from Prof. Gill in the past and used them in their research. Nevertheless, the non-availability of the actual height data does not hinder the basic logic of my argument that none of these presently available height shrinkage functions offer a reliable adjustment for the KMIC dependents' sample and most likely underestimate the actual rate of height shrinkage with aging among Koreans under Japanese rule.

Figure 3. Post-adjustment KMIC Male Dependents' Average Height by Researcher
Source: Graph combined and re-drawn from Choi (2006), Joo (2006), and Choi and Schwekendiek (2009)

The question of how representative Gill's finding of a continuous decrease in average height from the birth cohorts of the mid-1920s is of the overall Korean population has been an important topic of debate among researchers. The KMIC insurants' sample was the only data set that could trace the trajectory of Korean average height nearly immune from the effects of height shrinkage with aging, and any arguments for a continuous increase in Korean height over the colonial period had to refute the results obtained from the insurants' sample. Choi (2006) and Choi and Schwekendiek (2009) criticized the insurants' sample for a class bias, and the latter even completely excluded it from their analysis. Although the presence of a class bias in the insurants' sample is evident, I argue that it is still a more reliable indicator of the overall height trend compared to other height data from which the effects of aging on height cannot be reliably eliminated. In particular, the decreasing trend from the 1920s shown in the insurants' sample was likely to have been mirrored among the lower classes: Deteriorating nutritional intake and increasing numbers of pauper households that characterized the latter half of the colonial period (discussed in more detail in the next section) makes it highly unlikely that the masses' average height increased while those of the "middle class" decreased. A mere acknowledgement that the heights of different classes or occupations do not always move in the same direction is not a very convincing reason to discredit

the decreasing height trend in the KMIC insurants' sample after the mid-1920s as being applicable only to the members of the relatively privileged classes and not to the general public (Choi 2006, 67; Choi and Schwenkendiek 2009, 260).

In 2011, a different set of large longitudinal height data was published by Naksungdae economic historians Kim and Park. The authors analyzed the heights of hangryu deceased—dead persons "who did not have any acquaintances to claim the body"—in the colonial period (Kim and Park 2011, 590). The authors found a steadily growing average height of 25 to 30-year-old *hangryu decreased* throughout the period 1910-1942 with a total increase of 2.2 cm. While the authors did not accurately spell out what their analysis of height meant for Korean living standards, they insinuated support for the claim that Koreans became better off throughout the colonial period by placing their work in line with findings of robustly improving GDP, wage, life expectancy, and death rate. However, the data from *hangryu deceased* is not inconsistent with the inverse U-shape hypothesis tentatively implied by Gill (1995) and explicitly argued by Choi (2006) that Kim and Park (2011) attempted to disprove because their data set concerns the *birth cohorts* of 1880-1917, which corresponds to the left side of the formerly hypothesized inverse U-shape curve.[5] Kim and Park's analysis actually helps draw the left portion of the hypothesized inverse U-shape curve by providing previously unavailable large time-series height data on the birth cohorts of the pre-colonial and early colonial period.

5. Although this criticism might seem too obvious, the review of literature presented in Kim and Park (2011) contains inaccurate or contestable summaries of past works on Korean height and raises doubt on whether the authors have carefully examined past studies on Korean height amongst which they positioned their new contribution. For example, their statement that "Gill (1995, 1998), Choi (2006), and Choi and Schwekendiek (2009) indicated that the trend in Korean stature exhibited an inverse U-shape, with its peak occurring around the mid-1920s. These results suggest that Korean living standards improved up to the mid-1920s before proceeding to stagnate" is puzzling. As reviewed in detail in above, Choi and Schwekendiek (2009) did not claim an inverse U-shape trajectory of Korean height, and Gill (1995, 1998) and Choi (2006) explicitly mentioned that Korean height decreased after the mid-1920s. Gill acknowledged the fall in living standards, while Choi (2006) was more cautious about linking the decline in height with corresponding fall in living standards.

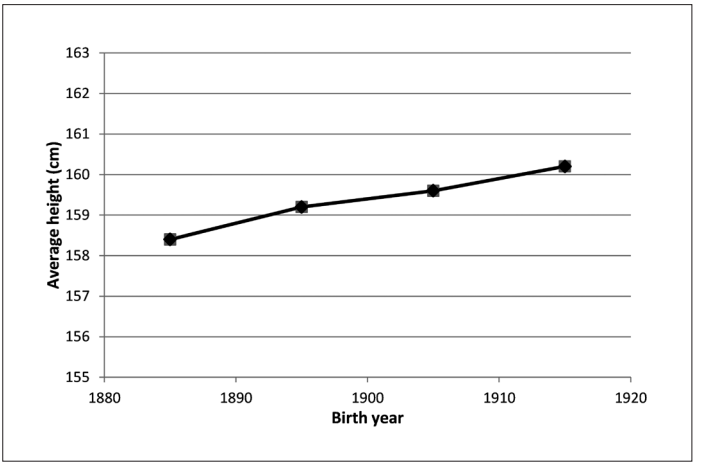

Figure 4. Mean Height of Male *Hangryu Deceased* 1880-1917
Source: Graph re-drawn from Kim and Park (2011)

A falling trend of Korean male height after the mid-1920s resembles the "antebellum puzzle," which refers to the phenomenon of declining US male height amongst robust economic growth in the decades before the American Civil War. Similar trends are also observed in the early industrialization processes of numerous other countries, including the UK and Germany. Korea after 1930 could be another example of the antebellum puzzle since it was going through early industrialization and according to some estimates experiencing a sustained increase in per capita GDP (Naksungdae Institute 2012).[6] What implication does the possibility that colonial Korea was another case of the antebellum puzzle have for our understanding of Korean living standards? Joo (2006) argued that even if heights decreased after 1930, one cannot conclude that there was a decrease in living standards because whether the antebellum puzzle was caused by a decline in living standards is still debated among economic historians. Admittedly, "dimensions of well-being may not move in the same direction," so height data alone cannot provide a comprehensive explanation of living standards (Komlos 2012, 5). However, there is now a consensus among economic historians that the antebellum puzzle was caused by a decline in food consumption (Komlos 2012, 1). If one interprets Korea in the 1930s as another

6. Estimates of per capita GDP by the Naksungdae Institute can be accessed from http://www.naksung.re.kr/xe/statis2012.

case of the antebellum puzzle, one would at least have to acknowledge its connection to nutritional intake, of which deterioration has also been disputed by recent revisionist research.

In this section, I analyzed previous works on Korean stature during and immediately before and after the colonial period. A critical review and synthesis of previous works on Korean height suggest that Korean height increased from the birth cohorts of the late nineteenth century into the early colonial period, reversed sometime in the 1920s to a downward trend, and reversed again around 1950 to a trend of a sustained increase.

In the next section, I will examine other indicators of biological living standards for two interrelated purposes. The first has to do with confirming the longitudinal trajectory of height I estimated from height data alone. As the available height data arguably lacks the resolution required for knowledge, I am compelled to check my height estimates against other closely related indices of biological living standards and see if I can draw any additional confirmation from them. The second has to do with the project of inferring living standards from various types of evidence. If the trajectory of height could be shown to coincide with those of other indicators of biological living standards, we would be able to present the actual trajectory of the biological living standards of the Korean population during the colonial period with a high level of confidence.

Due to constraints in volume, I will limit the scope of my review to three indicators of biological living standards: wage, food consumption, and inequality. Wage is examined as a proxy for income in the overall absence of other sources of income among the Korean masses. Income is a central determinant of biological and material living standards, and there is a strong correlation between income and stature (Steckel 1995). Also, "income is the most important determinant of diet," which closely connects it to the next indicator, food consumption (Steckel 1983, 2). Food consumption is largely analogous with caloric intake, which "is a reasonably reliable indicator of nutrition" (Steckel 1983, 2), and "nutrition is the most important external factor affecting linear growth" as human height reflects the cumulative effect of net nutrition during the growth period (Perkins et al. 2008, 153). Finally, as wage and food consumption data are only available in per capita averages and reveal nothing about their distribution among the population, I will also explicitly examine the trajectory of economic "inequality" to compliment the inference of biological living standards from the other two indicators.

Wage, Food Consumption, and Inequality in Colonial Korea

The Pre-colonial Period

Not much data is available for estimating various indicators of opulence in the late nineteenth century and early twentieth century immediately before annexation. While there is now a widespread agreement among economic historians that the Korean economy entered into an extended period of stagnation and decline at least from the beginning of the nineteenth century, it is also generally acknowledged that the Korean economy entered into a phase of growth from the late nineteenth century—especially after the 1890s—with its integration into the world market (Kim and Park 2012; Cha 2012). Land rent and nominal wage were estimated to have entered a phase of sustained increase from the mid-1880s (see Figure 5).

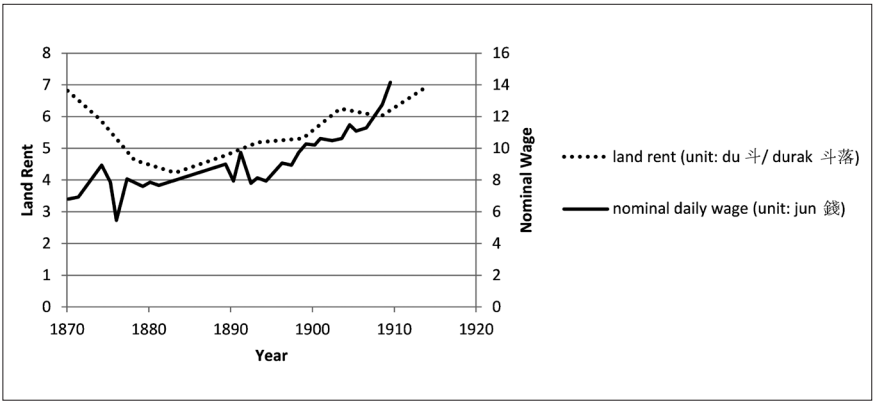

Figure 5. Land Rent and Nominal Wage
Source: Graph re-drawn from Park (2006) and Lee (2000)

Despite the positive reversal of certain economic indicators in the final decades of the nineteenth century, there is hardly any statistical data that shows a corresponding upturn in Korean *living standards*. Estimates of real rice wage show a continuous trend of decline and stagnation throughout the late nineteenth century, casting doubt on whether there was any significant improvement in biological living standards in the decades before annexation (Lee 2000; Jun and Lewis 2007).

The Colonial Period

Real wage

Real wage is an important indicator of living standards, especially for the masses whose reliance on labor income is very high. Huh (1981) estimated a stagnating trend of unskilled real wage over the colonial period with a slightly decreasing trend after the early 1920s. While recent revisions by Naksungdae economic historians provided a more optimistic estimate of the trajectory of unskilled real wage, even this revised estimate clearly shows the negative trend in the 1920s and 30s (Lee and Cha 2007, 62). Lee and Cha (2007) stressed that unskilled wages in Korea showed a rapid rate of growth at 0.4 % per annum for the period 1910-1942; however, even if such figure is true, calculating a single average growth rate for the entire colonial period reveals little about the trajectory of living standards under colonial rule, especially considering the fact that the positive average growth rate in their revised estimates is due to the temporary surge of wage in the early colonial period and the wartime economy of the late colonial period.

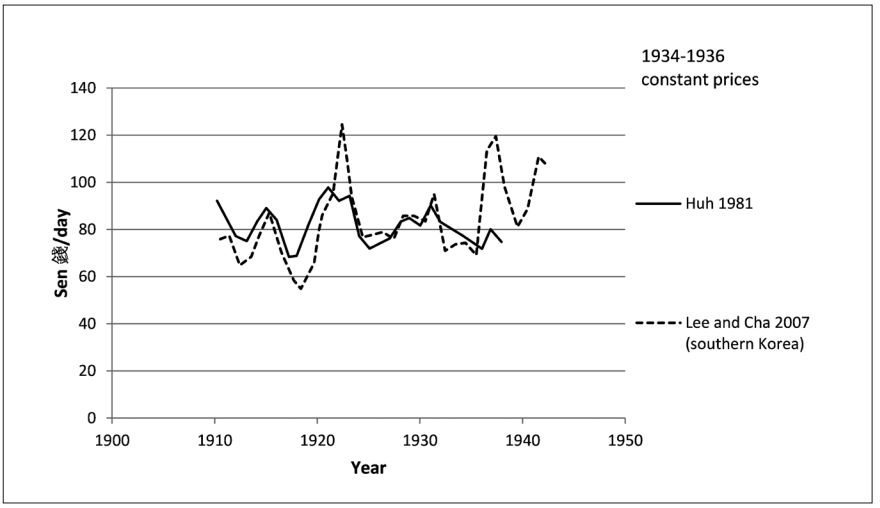

Figure 6. Unskilled Wage (All Sectors)

Consumption

How did trends in food consumption change over the colonial period? Despite

the uncertainty of the exact amount of rice production before 1918 and population before 1925, it is clear that per capita rice availability continuously decreased from the beginning of the colonial period (with the exception of the temporary increase in the late 1930s and 40s) (Suh 1978, 86; Huh [2005] 2011, 275; Park 1996, 105). The decrease in rice availability had to be supplemented by other grains of lower preference such as barley, millet, and soybeans, of which consumption did not increase either. No research has refuted the fact that per capita grain consumption decreased during the colonial period. Estimates of per capita calorie intake from grains also show a decreasing trend even in the most optimistic estimates from the Naksungdae Institute. The wartime 1940s, which are not covered in most statistical estimates due to insufficient data, also saw a drastic drop in grain consumption. According to one estimate, it dropped from an average of 1.277 *suk* in 1942-1944 to 1.076 in 1945 (Bank of Korea 1949, I-63; Cha 1997, 157). This trend is roughly consistent with the height trend discussed above, which showed a continuous decrease from the birth cohorts of the 1920s until the Korean War.

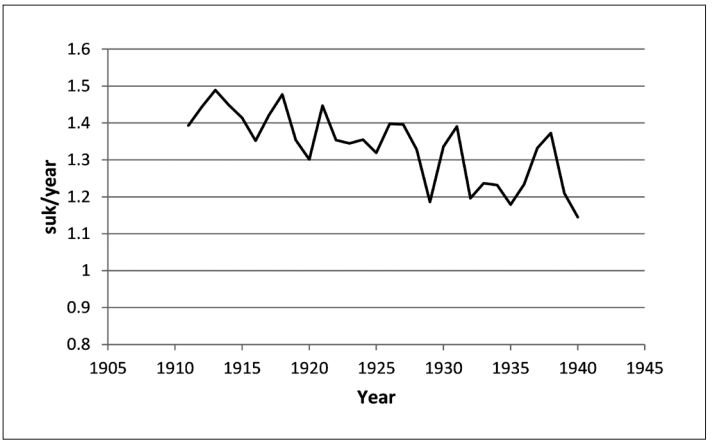

Figure 7. Per Capita Grain Consumption
Source: Naksungdae Institute of Economic Research (2012)
(http://www.naksung.re.kr/xe/index.php?mid= statis2012&document_srl=104983 [Table II-57])

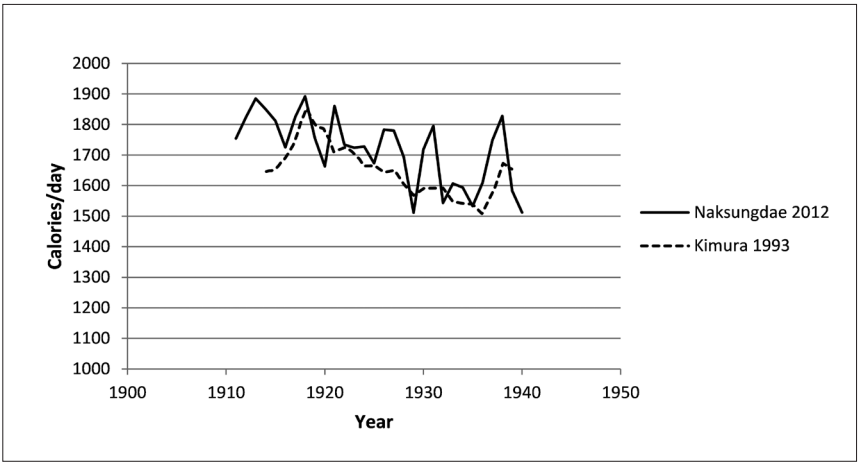

Figure 8. Capita Calorie Intake from Grains

Similar to the trends in per capita grain consumption and caloric intake, per capita expenditure on grains also shows a decreasing pattern since the early 1920s.

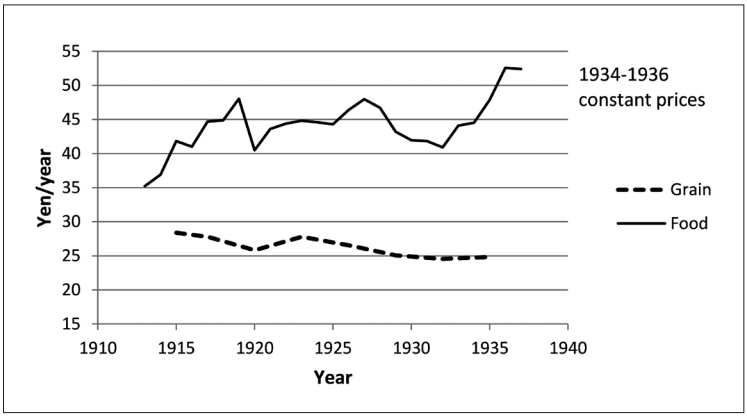

Figure 9. Per Capita Expenditure on Grain and Food
Source: Calculated from Terasaki (1988, 66; 283) and Park (2009)

A decrease in per capita grain consumption does not necessarily mean that per capita food consumption fell as well. In order to examine trends in nutritional status more accurately, one would need to look at non-grain food consumption as well. Recent revisionist works have stressed the increase in the per capita

consumption of non-grain foods in an effort to refute the traditionally popular view that per capital nutritional intake decreased during the colonial period. For example, Joo (2012, 209) argued that the increase in the consumption of potatoes and sweet potatoes partially compensated the decrease in the consumption of grains, resulting in a mere 10 % decrease in daily caloric intake between 1912 and 1939. He added that increases in the consumption of other foodstuffs such as meat, vegetables, and fish would have offset the decrease in grain consumption to a point where there was virtually no decrease of nutritional intake during the colonial period. Joo (2012, 208-09) estimated that by 1939, per capita consumption of meat rose to 160 percent, fruit and vegetables to 230 percent, marine products to 330 percent, and manufactured foods to 250 percent of that in 1912.[7] In particular, the Naksungdae economic historians' significant upward revision of seafood production vis-à-vis older estimates by Suh (1978) and Asia Long-Term Historical Statistical Database importantly contributed to their rejection of the deterioration in per capita food consumption (Lee and Song 2012).[8] While objections to decreasing food consumption are by no means new, the Naksungdae economic historians' recent revisionism presents a stronger argument than previous ones that focused on expenditure instead of the actual per capita availability of various foodstuffs.[9]

As for per capita overall private consumption, there is a clear increase over the colonial period. All estimates of per capita total private consumption show an increasing trend from the beginning of the colonial period until around 1940. Real per capita private consumption estimates by Mizoguchi (1988) show an enduring upward trend between 1913 and 1937 with an overall increase of 46 percent, and recent revisions from the Naksungdae Institute also indicate a continuous increase from 1911 to 1940 with an overall growth of 71 percent.[10]

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7. For a criticism of these estimates, see Huh 2015b.
8. Asia Long-Term Historical Statistical Database can be accessed from http://www.ier.hit-u.ac.jp/COE/Japanese/online_data/korea/koreaj.htm.
9. Terasaki (1988, 64) estimated that real per capita expenditures on food in Korea increased with an annual average of 0.56 % during 1913-1938. My calculations based on Mizoguchi's (1988) figures of total expenditure and Park's (2011) estimates of population shown in Figure 9 also reveals that real per capital expenditure on food increased during 1913-1937.
10. Private Consumption (table I-14) and population (table I-23) estimates of the Naksungdae Institute can be downloaded from http://www.naksung.re.kr/xe/index.php?mid=statis2012&document_srl=104983.

In sum, per capita rice and grain consumption decreased, per capita food consumption was recently argued by revisionist scholars to have remained stagnant thanks to a rapid increase of non-grain food consumption, and per capita overall consumption increased over the colonial period.

Inequality

What does the above examination of wages and consumption indicate about Korean living standards during colonial rule? Most estimates of real unskilled wage show a stagnating trend across the colonial period, and all estimates show a falling trend in the 1920s and 30s. Per capita rice and grain consumption continuously decreased throughout the colonial period. Nevertheless, there is also a range of indicators that show a significant improvement over the colonial period. Real per capita private consumption increased continuously during 1911-1939 (Joo 2012, 203). The average consumption of non-grain foods such as meat, fish, and vegetables also increased markedly.

A generally observable pattern is the downward trajectory of indicators that tend to be more equally distributed among the population (unskilled wage, rice consumption, and grain consumption) compared to the increasing trend of indicators with more potential for skewed distribution (non-grain foods consumption and overall private consumption). Such consumption pattern reveals that economic growth during the colonial period was accompanied by increasing inequality—a fact that is consensually acknowledged by scholars. Table 1 classifies agricultural households during the colonial period according to land possession. The rapid process of polarization of land possession is clearly visible, especially in the 1920s and the 1930s as the Campaign to Increase Rice Production 産米增産計劃 was taking place in Korea. Recent estimates of the Gini Index during the colonial period show a constant increase from circa 0.35 in 1911 to almost 0.5 in 1940 (Cha 2012, 351).

Table 1. Inequality of Landownership in Colonial Korea

Unit: (%)

Year	Farmer-owners	Farmer-owner-tenants	Tenants
1916	20.1	40.6	36.8
1921	19.6	36.6	40.2
1926	19.1	32.4	43.3
1931	17	29.6	48.4
1936	17.9	24.1	51.9

Source: Hisama (1944, 33)

Surely, a rise in equality might just mean that the masses benefited less than the wealthy from the fruits of economic growth (Cha 2012, 373). Couldn't it have been that people were getting richer on the whole and substituting grain with a diversified diet? Statistics on the level of poverty among the Korean masses makes such possibility highly unlikely. The proportion of pauper households increased dramatically from 13.8 % of the entire population in 1926 to 35.5% in 1933 (Huh 2011, 284).[11] Moreover, it has been repeatedly pointed out that the wage of the average unskilled worker was insufficient to support a family. Huh (1981) showed that the wage of a coolie in 1928 was barely sufficient to cover his own expenses and insufficient to cover the necessary expenses of a family. An early analysis of the wage and expenses of an unskilled worker in Seoul in 1936 by Grajdanzev (1944, 180-82) produced a similar conclusion. As in all underdeveloped economies, unskilled workers and poor farmers constituted the majority of the workforce in colonial Korea (Gill 2000). Qualitative evidence also shows that increasing inequality was coupled with decreasing living standards for the masses. Hisama Kenichi (1944, 347), a Japanese agricultural economist, who worked as a tenant supervisor 小作官 in the 1930s and 1940s in Korea wrote: "The development of agricultural production is clear in regions where landlord functions are potent; however, it would be close to the reality to say that the lives of peasants keep getting poorer."[12] In light of such evidence of prevailing poverty among Korean unskilled workers and peasants, it is unlikely

11. Here, pauper households include *semin* 細民, households that can barely make a living without the help of others and *gungmin* 窮民, households that need urgent assistance.
12. The translation is mine.

that the decrease in per capita grain consumption among the masses was offset by an increase in the consumption of other foodstuffs of higher quality. It is hard to imagine how the masses could have consumed more fish, meat, and vegetables as well as other non-food commodities when more and more of them were failing to make ends meet and had to reduce their already insufficient grain consumption. The fact that there was no sustained increase in real unskilled wage (especially in the 1920s and 30s) also casts doubt on the interpretation that the masses were upgrading their diet with larger quantities of non-grain food.

Post-Independence

The immediate aftermath of independence saw a collapse of the Korean economy, which resulted in deteriorating living standards. For example, real wage in Seoul halved during 1945-1948 and recovered only after 1949 during the Korean War (1950-1953). The following Rhee Syngman regime was characterized by an overall stagnation of wages. Real wage rose sharply from the late 1960s in South Korea as it embarked on the well-known "miraculous" growth for the next several decades (Kim and Park 2007).

Per capita grain consumption in the early 1940s deteriorated rapidly due to wartime shortages. The deterioration per capita grain consumption continued under the subsequent US military government rule of South Korea (1945-1948). Rice production plummeted in South Korea as the division of Korea stopped the flow of fertilizers from northern Korea and many peasants sold off their oxen to purchase land from landowners who were hurriedly selling their land for fear of confiscation (Cha 1997). In addition, population increased rapidly in South Korea from 15,879,110 in May 1944 to 19,369,270 in August 1946, and then to 20,188,641 in May 1949 due to mass immigration from overseas and North Korea (Statistics Korea 1993, 2). As a result, grain availability remained poor throughout the US military government rule despite its interdiction of rice exports to Japan (Cha 1997). Only in the early 1950s does per capita grain consumption start to recover. Such trend in grain consumption after the colonial period is roughly consistent with the height trend examined in the preceding section.

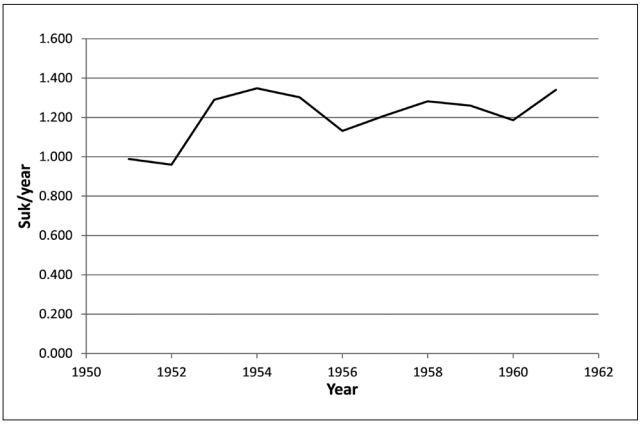

Figure 10. Per Capita Grain Consumption Recovery in the 1950s
Source: South Korea Yearbook of Statistics, retrieved from Korean Statistical Information Service (KOSIS) website. Aggregate consumption was calculated by combining production and import. Population estimates were taken from the Naksungdae Institute.

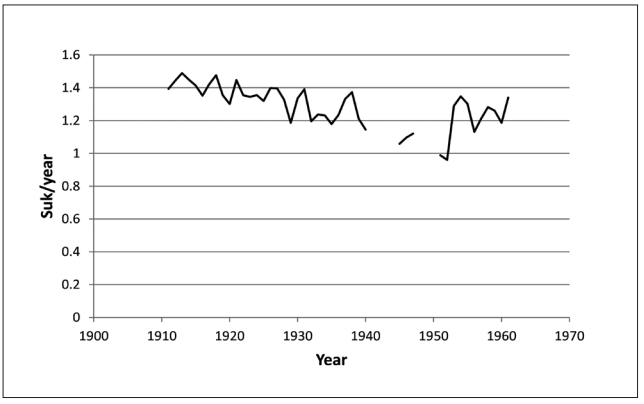

Figure 11. Per Capita Grain Consumption 1911-1961
Source: For 1911-1940, same as Figure 7. For 1945-1947, Bank of Korea (1949). For 1951-1961, same as Figure 10.

Economic inequality dropped significantly after independence in South Korea. Land reforms carried out before the Korean War (1950-1953) rapidly alleviated the extreme inequality of the late colonial period. Since then, inequality never rose continuously in South Korea until recent decades (Campos and Root 1996, 9).

Table 2. Inequality of Landownership South Korea, 1945-1951

Unit: (%)

Year	Farmer-owners	Farmer-owner-tenants	Tenants
1945	14.2	35.6	50.2
1947	17.0	39.6	43.4
1949	37.4	41.4	21.2
1951	80.7	15.4	3.9

Source: Korea Rural Economic Institute (1988)

In this section, I examined the trajectory of wage, consumption, and inequality during and immediately before and after the colonial period to complement the analysis of height presented in the preceding section. The deterioration of real unskilled wage, grain consumption, and economic equality in the interwar years of the 1920s and 30s and the subsequent recovery after the late 1940s and early 1950s can be observed across almost all estimates, which is in accordance with the trajectory of Korean height indicated by the KMIC insurants' sample.

In Lieu of a Conclusion: Interpretation of Data and Remaining Problems

Since decolonization, it has commonly been acknowledged that most Koreans experienced declining living standards under Japanese colonial rule. The recent revision from South Korean economic historians centered at the Naksungdae Institute directly opposes such an understanding and argues that Koreans, in general, became better off under colonial rule. To evaluate the plausibility of the recent revision of Korean living standards, I examined the trajectory of Korean stature through a critical review of past literature. I showed that the decrease in Korean average height from the birth cohorts of the 1920s indicated by the KMIC insurants' sample is a reasonable estimate compared to others that failed to offer a reliable way to eliminate the effects of height shrinkage with aging. Korean height by birth cohort likely decreased after sometime in the 1920s and recovered only after independence and the ensuing Korean War. I also stressed that the analysis of the *hangryu deceased* presented by Kim and Park (2011), which was intended to refute existing works on Korean height and support the revisionist thesis that Korean living standards improved throughout the colonial period, actually says nothing about the birth cohorts after 1917. Kim and Park's

finding applies exclusively to the birth cohorts of 1880-1917 and supports the inverse U-shape hypothesis argued by Choi (2006).

The trajectory of Korean height from the 1920s is largely consistent with trends in other major indicators of biological living standards of the general populace. Unskilled real wage showed an overall trend of stagnation during the colonial period, and the 1920s and 30s likely saw a continuous decrease. Rice and grain consumption decreased for the most part of the colonial period and started to recover only from the early 1950s. Although per capita consumption of non-grain foods and overall per capita private consumption increased steadily, they were most likely accompanied by a highly skewed distribution. Revisionist tendencies to interpret the increase in the average consumption of non-grain foods as a result of a widespread diversification of diet among the Korean masses lack plausibility considering the prevailing poverty of the 1920s and 30s. Inequality surged from the mid-1920s throughout the 1930s in accordance with deteriorating trends in height, wage, and grain consumption. By and large, the trends in wage, consumption, and inequality roughly match that of stature from the 1920s onwards. This result fits well with the traditionally prevalent thesis that the masses suffered from the installation of extractive agriculture and industry in the 1920s and 30s by the Japanese and became gradually better off only during the economic recovery after the end of the Korean War. The revisionist claim that Koreans—including the masses—became better off during the colonial period appears highly questionable in light of the historical trajectory of stature as well as relevant statistics on income, consumption, and distribution.

Some supporters of the thesis that Korean living standards increased robustly during the colonial period may contest that as height is affected not only by the living standards during infancy but also during later stages of the growth period, stature does not necessarily reflect the living standards at the time of birth even when the two show a chronologically consistent pattern. Therefore, a certain historical trajectory of height, even if correctly estimated, does not single out the real trajectory of living standards that caused it and allows at least some room for alternative explanations. One revisionist economic historian interpreted the estimated decrease in height among the birth cohorts in the latter half of the colonial period as a result of wartime shortages in the late ’30s and ’40s (Joo 2006). While such reasoning is true *in principle*, it lacks plausibility compared to the standard practice of interpreting height as reflecting

the living standards of the birth year. "Linear growth failure is *largely confined to the intrauterine period and the first few years of life*, and is caused by inadequate diets and frequent infections" (Victora et al. 2008, 342; emphasis mine). While some previous authors on Korean height correctly mentioned the acceleration of growth during adolescence and pointed to the possibility of explaining attained height by the nutritional status during adolescence, the relevant scientific literature attests the predominant importance of the nutritional status at infancy (<2 years old) for attained height. For example, according to Perkins et al.,

> Two growth periods are important for determining adult height: growth occurring from conception to 2 years of age, and growth occurring during adolescence before the onset of puberty. *Adult height is primarily established during the first growth period in early childhood*, when nutritional requirements are greater than at any subsequent time.…The second growth period presents an opportunity for "catch-up growth"…Although there is debate as to the extent to which catch-up growth can occur after 2 years of age, it appears that catch-up growth is not sufficient to fully make up for deficiencies in the first growth period and achieve full potential. (2008, 150; emphasis mine)

These basic facts about human growth, coupled with the consistency of the overall trajectory of major indicators of biological living standards with that of stature from the birth cohorts of the 1920s onwards, strongly suggest that the actual trajectory of living standards did not lag behind that of height by birth cohort by any significant margin during this period.

I will conclude the paper with a brief discussion of a lingering problem in the above analysis of height and living standards. Contrary to the trend since the 1920s, the estimated rapid increase in height among the birth cohorts in the final decades of the Lee dynasty from around 1880 to the 1910s (which is primarily supported by the data from *hangryu deceased* in Kim and Park [2011]) are not easily corroborated by concurrent trends in other indicators of living standards. As mentioned above, despite some reasons to believe that the overall economic situation began to improve in the late nineteenth century, no quantitative indicator of *living standards* produced by the "cliometric revolution" in Korean economic history explains the increase in height in the final several decades of the Lee dynasty estimated by Kim and Park's analysis of the *hangryu deceased*. Did Korean living standards actually improve robustly during this

period but are resisting our cognitive grasp because of the scarcity or biases in remaining historical records? Or did Korean height grow even when living standards were not yet rising? Or, perhaps, was there no increase in stature at all?

If Kim and Park's estimates of Korean height are correct, and human height primarily reflects the biological living standards at the time of birth, one reaches a conclusion that seems to be more in line with the traditional nationalist rather than revisionist agenda: if Korean living standards were robustly improving in the late Lee dynasty, this would lend a strong support for the claim that Korea could have developed successfully on its own without being colonized by Japan. Even the improvement in the initial decade of the colonial period seems to favor the nationalist agenda considering the fact that the first decade "turned out primarily to represent a preparation for effective control of the economy rather than actual introduction of any significant change" and that the positive trend soon reversed to a downward one as the colonial economic system took root in earnest from the 1920s (Suh 1978, 8).

Perhaps in consideration of these problems and enigma, Kim and Park (2011, 592) construed their finding of a sustained increase in Korean height among the birth cohorts of 1880-1917 as having been caused by longer "time spent growing up under Japanese rule" on the implicit assumption that the colonial period saw a robust improvement in living standards. Such an interpretation with nearly three decades of time-lag between birth year and living standards is unsatisfactory, especially in the absence of a corresponding increase in other indicators of well-being during the colonial period. As discussed above, per capita caloric intake—the most important environmental factor for human stature—never increased continuously at any stage of the colonial period even in the most optimistic estimates, and other closely related indicators such as real unskilled wage decreased in the 1920s and 30s. This problem, together with the criticism by Huh (2011b, 2015a, 2015b) that the Naksungdae economic historians' estimates of an exceptionally rapid increase in economic indicators (most importantly in rice production, which was the most important industry at the time) during the 1910s massively overstates the actual rate of improvement, raises the question of how there could have been, or even whether there was, after all, a sustained increase in average height from the birth cohorts of the 1880s to the late 1910s as was argued by Kim and Park (2011). In the absence of clarifying future research, it seems apt to suspend any strong judgments on the trajectory of Korean height in the last decades of

the Lee dynasty and the first decade of the colonial period. The difficulty of corroborating the hypothesized increase in height with relevant indicators of biological living standards calls for attempts to improve the resolution of Korean height in this early phase of Korean modernity.

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Abstract

Stature has been a widely used measure in the recent debate on Korean living standards under Japanese colonial rule. Past studies tended to focus on presenting novel data or calculation methods and insufficiently accounted for the divergence of arguments in the literature. This paper attempts the task of critically reviewing past research on Korean height during the colonial period and suggesting a reasonable interpretation with regard to living standards. A careful review supports the previously influential claim that average height decreased from the birth cohorts of the 1920s until around 1950. Other indicators of living standards closely related to the biological living standards of the general populace such as unskilled wage, food consumption, and inequality are consistent with height trends from the 1920s onwards, lending plausibility to the traditionally prevalent thesis that Koreans experienced a decrease in living standards as the colonial economic system took root in earnest. Recent revisionist claims that the colonial period was a boon for Korean well-being must be reconsidered.

Keywords: economic history, living standards, stature, anthropometrics, Korea, Japanese colonialism

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