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Increasing Teachers' Workloads in the Form of Quantitative Expansion in Extracurricular Activities: Aggregated Data Analysis of Past Working Hours using a General Linear Model*

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In recent years, teachers' increased workloads have become an issue for policy, and have been multiply pointed out, deriving as they do from peripheral duties such as paperwork, in academic research as well. However, these mentions have not been based on sufficiently solid proof. Here, this paper compares teacher working hours surveys extant from the 1950s–1960s and from the late 2000s, using a general linear model. Results show that it is not necessarily the case that teachers in the late 2000s are spending more time on peripheral duties like paperwork than their 1950s–1960s counterparts, but that the time they spend on educational activities (in particular, extracurricular activities) is longer.

Keywords: increasing teacher workloads; working hours; peripheral duties; extracurricular activities; general linear model

1. Issues

The purpose of this paper is to examine the increased workloads of teachers at public elementary and junior high schools (hereafter, teachers), through a comparison of the aggregated results of working hours surveys from the 1950s–1960s and the late 2000s.

In recent years, Japan has seen increased policy and academic interest in teachers' workloads. The results of the 2nd OECD Teaching and Learning International Survey (TALIS2013), released in June 2014, showed that teachers in Japan spend considerable time on so-called peripheral duties (Takagi 2015) such as paperwork which are not the educational activities originally intended (National Institute for Educational Policy 2014). Thanks to this survey, the

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Central Council for Education in the Minister of Education, Culture, Sports, Science and Technology (MEXT) has promoted "Schools as Teams" and, in order to reduce the burden of peripheral duties on increasingly busy teachers and increase their time spent with children, is debating the use of non-teaching staff such as school clerks.[1]

Teaching research in recent years has also focused on the increasing workloads of teachers (Takaira 2007), frequently pointing out the increasing demands on teachers of peripheral duties, and noting in particular that it was the educational reforms of the 1990s and thereafter which worsened the teaching environment in the form of overflowing paperwork (Kano 2010, Yamada 2013 etc.). For example, the introduction of the school choice system has required PR activities and individual visits to possible entrants in order to attract students (Yamamoto 2004), and that of the school evaluation system has increased the number of reports required (Kudomi 2012).

However, little of the research such as that cited above on the increase of teachers' peripheral duties is backed by actual data. "Increasing workload" (*taboka*) simply means "growing more busy," and contains nuances of changing duties (Aoki/Horiuchi 2014). As an approach to workloads as a change of duties, the comparison of working hours at two different points comes to mind (Aoki/Kanbayashi 2013), and research proving that teachers' working hours has changed before and after educational reforms overseas does exist (Wylie 1997 etc.). Elsewhere, previous research in Japan has showed teachers' working hours for individual years, with TALIS2013 as an example, but there has been effectively no research comparing and discussing the actual working hours at multiple accumulated points in time (Yufu 2009).

As well, there is a record of pointing out the steady increase in duties of teachers postwar (Kitagami/Takagi 2007), and with regard to teachers' clerical tasks in particular, an overload of duties was already being noted in the 1950s and 1960s.[2] As noted above, many people point out the increase in teachers' peripheral duties due to educational reforms in the Japan of the 1990s and thereafter, but it is also possible that teachers were suffering from an overload of paperwork even before that. The increase in teachers' peripheral duties can be considered from this point of view as well.

Based on the above, this paper focuses on the individual working hours composing the entire week's working hours[3], inquiring whether teachers in recent years are growing busier, in particular with regard to paperwork and other peripheral duties, compared to the 1950s and 1960s when an overload of paperwork duties was noted. The analysis below looks only at the quantitative aspect of total working hours and individual working hours in teachers' workloads[4], but is original in educational research in its consideration of Japanese teachers' increasing workloads from this perspective.

2. Data used and analysis methods

The data used in this analysis is the aggregate results of 14 surveys[5] into total working hours/individual working hours conducted on public elementary and junior high school teachers by MEXT (including the former Ministry of Education), prefectural boards of education, and teachers' unions in the 1950s–1960s and in the late 2000s and thereafter. The aggregate results of these 14 surveys are the only data possible to obtain concerning teachers' total working hours and individual working hours, and there is no other data which can be examined for a focus on teachers' increasing workloads with regard to total working hours and individual working

hours.[6]

Below, I calculate and organize total working hours and individual working hours in the 1950s–1960s and 2000s based on these 14 surveys. Total working hours and individual working hours use weekly averages and include overtime at school and work brought home.[7]

As well, regarding the calculation of individual working hours, I reorganize the individual working hours shown in the aggregate results of the 14 investigations into the four major categories used in the primary aggregation of the 2006 MEXT "Teachers' Actual Working Hours Survey" (hereafter, MEXT survey 2006). The reason for this is that the categories used in measurement vary among the 14 surveys, and when comparing all 14, it is difficult to use more detailed categories than the four primary ones above. The four major categories are as follows.

First, "duties directly concerned with educational activities." The Educational Guidelines published postwar in Japan regulate not only the official curriculum of subjects but also moral education, class activities, student councils, club activities (for elementary schools only), and school events, comprising extracurricular special activities (Ohtsuka ed./auth. 2013). Further, teachers' work include not only the official educational curriculum but also extracurricular activities. This applies to extracurricular activities such as afterschool review sessions and club direction, school lunch and cleaning supervision, and individual guidance meetings with students. The "duties directly concerned with educational activities" include the academic subject curriculum, special activities, and extracurricular activities in those duties performed in direct contact with students.

Second, "duties indirectly concerned with educational activities." These include preparing educational materials, grading and confirming materials collected from students, and class direction activities such as making student rolls and organizing classroom environments, covering activities subsequent to classes held in the classroom.[8]

Third, "duties concerned with school management and other school affairs." These include duties concerned with overall school management such as paperwork to do with reports to the principal or the school board, meetings and training held within or outside the school, and general school duties. Japanese schools use a system which divides the general school duties among all the teachers and staff (Kamitaki 1984). Elsewhere, for instance in America, school management duties are limited to principals and vice-principals, and teachers are not expected to perform them (Research Association for Overseas Teachers' Salary ed. 2007), meaning that teachers in America share almost nothing of these duties (Sakuma 2007).

Fourth, "duties concerned with external affairs," including meetings with parents and with local residents and school boards.

Through the process above, I calculate the total working hours and the individual working hours for each of the 4 duty categories for each survey. However, simply comparing these values in order to judge the national trend towards increased teacher duties may well lead to a mistaken conclusion. Simple comparison does not take into account the influence on total working hours and individual working hours shown in the official results of the differences in design of each survey, such as the period it was carried out, the area, and the investigated attributes. Here, I have chosen to apply multivariable analysis in the form of the general linear model as a method of comparative analysis taking these influences into account.[9]

Regarding comparison with the general linear model, I assembled into the analysis data as much as possible of the aggregate data from the 14 surveys released concerning total working hoursand individual working hoursdivided by gender and other categories.[10] The results gave me

Table 1 Descriptive statistics for variables used in comparative analysis through the general linear model

List of Variables	Mean	S.D.	Min	Max
Average weekly total working hours	57.89	6.88	38.47	92.98
Average total weekly working hours for educational activities (regular timetabled and non-regular)	27.62	9.34	.00	83.20
Average total weekly working hours for planning, preparation, class management and assessment	13.08	4.99	.17	33.50
Average total weekly working hours for school management	15.91	8.58	4.38	68.15
Average total weekly working hours for contact with parents, local residents and boards of education	2.02	1.62	.00	8.73
Late 2000s dummy variable (the survey conducted in the late 2000s and thereafter = 1, otherwise = 0)	.39	.49	0	1
Gender	.01	.35	–.5	.5
Homeroom Teachers' dummy variable	.00	.20	–.5	.5
Junior high school teachers' dummy variable (junior high school teachers = 1, elementary school teachers = 0)	.47	.50	0	1
November's dummy variable (the survey conducted in November =1, otherwise = 0)	.31	.47	0	1

(Note) N = 210, S.D. means standard deviation.

roughly 210 data types among the aggregate data used from the 14 surveys here. By assembling these aggregate results by type into the analysis data, I was able to grasp information concerning the differences in total working hours/individual working hours which appeared according to attributes.

Based on this information, I configured the independent variables and control variables to be used in the general linear model. The independent variables were "Late 2000s dummy variable" and "Junior high school teachers' dummy variable × Late 2000s dummy".[11] When inquiring whether total working hours/individual working hours were longer in the late 2000s and thereafter compared to the 1950s–1960s, the former indicated elementary school teachers' results and the latter junior high school teachers' results. The control variables were "Survey ID" and those extracted from each survey's aggregate data, "Junior high school teachers' dummy," "Gender," "Homeroom teachers' dummy variable," and "November's dummy variable."[12] The subordinate variables were the total working hoursand the individual working hours for each of the 4 categories above.

Descriptive statistics of variables used in the general linear model are presented in Table 1.

3. Analysis results

The total working hours/individual working hours calculated through the aggregate results of each survey by the process detailed in part 2 are summarized in Figure 1 for elementary school teachers and in Figure 2 for junior high school teachers. The analysis results derived from the general linear model are shown in Table 2.

(1) Total working hours

First, to summarize the result of the calculatedtotal working hours, the average for elementary school teachers in both the 1950s–1960s and the late 2000s and thereafter was just under 60

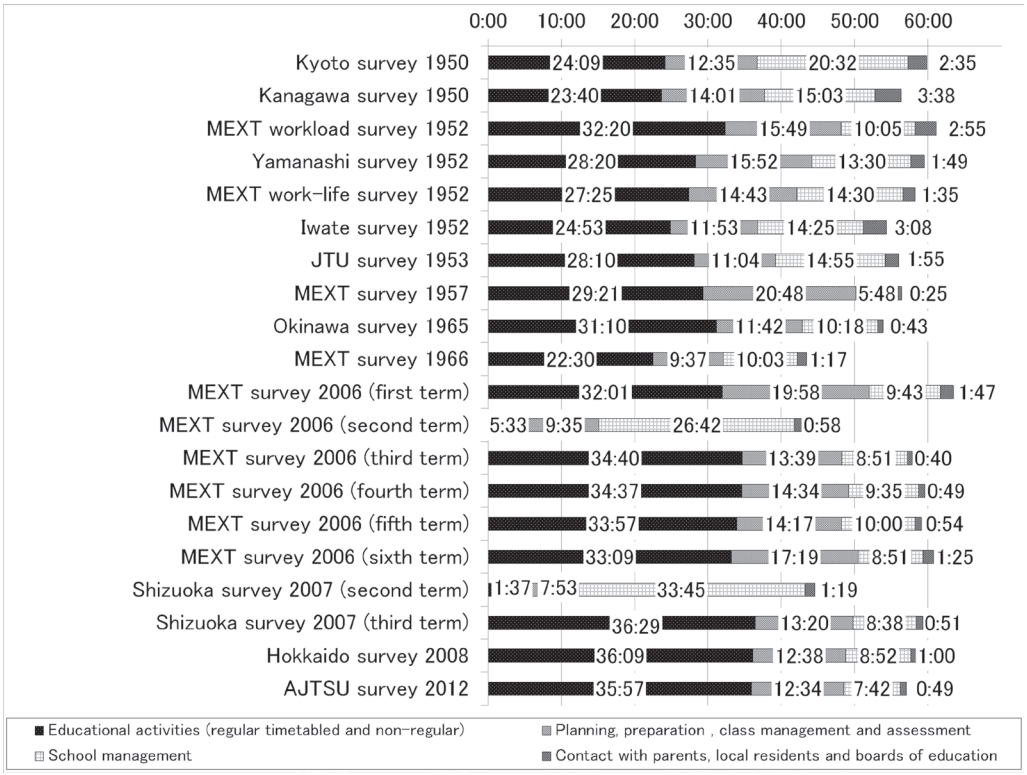

Figure 1 Total working hours/individual working hours for elementary school teachers (weekly average)

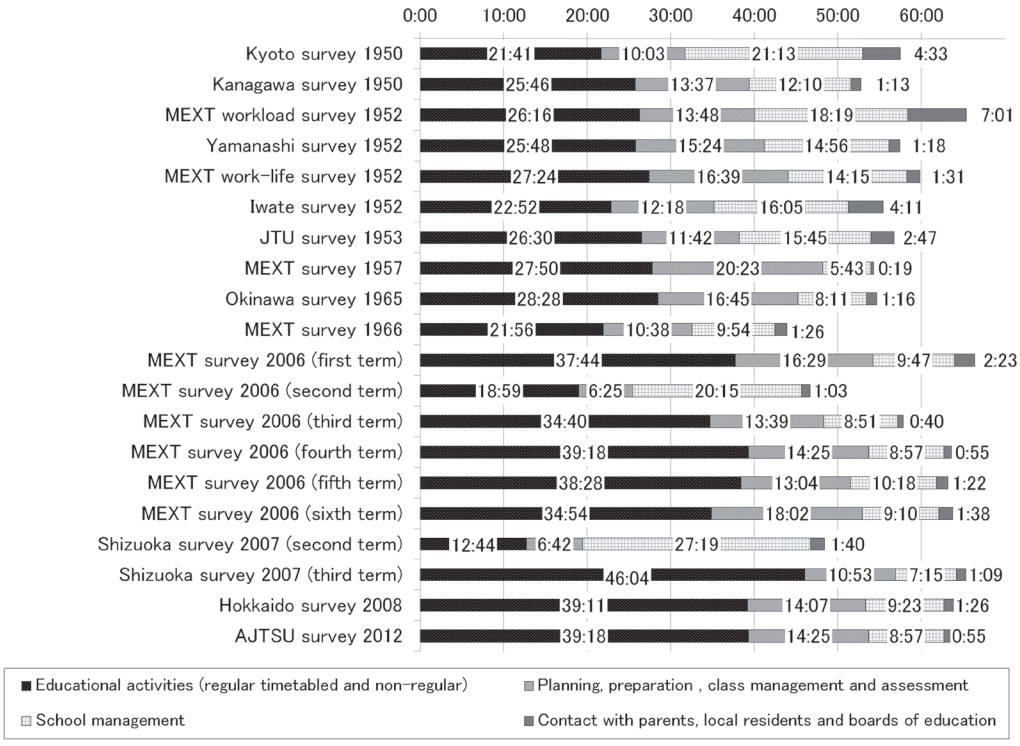

Figure 2 Total working hours/individual working hours for junior high school teachers (weekly average)

Table 2 Results of analysis using the general linear model

	Model.1			*Model.2*			*Model.3*			*Model.4*			*Model.5*		
	Average weekly total work working hours			Average total weekly working hours for teaching (regular timetabled and non-regular)			Average total weekly working hours for planning, preparation, class management and assessment			Average total weekly working hours for school management			Average total weekly working hours for contact with parents, local residents and boards of education		
	B		*S.E.*	*B*		*S.E.*	*B*		*S.E.*	*B*		*S.E.*	*B*		*S.E.*
Intercept	44.01	**	3.35	22.69	**	3.48	9.51	**	2.27	9.93	*	3.85	1.17		.81
Late 2000s dummy variable	14.20	**	4.75	10.70	*	4.94	4.24		3.22	-.33		5.46	-.41		1.15
Junior high school teachers' dummy variable	–.68		.85	-.94		.89	1.22	*	.58	.10		.98	.38	†	.21
Junior high school teachers' dummy variable × Late 2000s dummy variable	5.33	**	1.35	9.44	**	1.40	-1.73	†	.92	-2.65	†	1.55	-.17		.33
Gender	1.69	†	.92	.85		.95	-2.04	**	.62	1.16		1.06	1.08	**	.22
Homeroom teachers' dummy variable	1.62		1.64	7.08	**	1.70	4.37	**	1.11	-8.85	**	1.88	.05		.40
Novembers' dummy variable	.72		4.70	.03		4.89	-.12		3.19	.80		5.40	.35		1.14
[Survey ID]															
Kyoto survey 1950 (N = 53)	14.45	**	3.38	–.65		3.52	–1.44		2.30	14.81	**	3.89	1.98	*	.82
Kanagawa survey 1950 (N = 4)	7.79		6.21	2.17		6.46	3.49		4.22	2.32		7.14	–.70		1.51
MEXT workload survey 1952 (N = 14)	18.71	**	3.56	8.11	*	3.71	4.44	†	2.42	3.44		4.10	2.54	**	.87
Yamanashi survey (N = 4)	15.07	*	6.21	4.92		6.46	6.01		4.22	3.96		7.14	–.16		1.51
MEXT work-life survey 1952 (N = 24)	14.19	*	5.83	4.19		6.07	6.17		3.96	3.68		6.70	–.19		1.42
Iwate survey 1952 (N = 8)	8.79		5.99	1.95		6.23	2.81		4.07	2.90		6.88	1.72		1.46
JTU survey 1953 (N = 4)	12.01	**	4.07	5.08		4.23	1.13		2.76	5.12		4.68	.69		.99
MEXT survey 1957 (N = 12)	4.56		5.91	4.30		6.15	10.42	*	4.01	.62		6.80	–1.20		1.44
Okinawa survey 1965 (N = 4)	12.34	**	4.07	8.81	*	4.23	4.00		2.76	–.56		4.68	–.47		.99
MEXT survey 1966 (N = 2)	–			–			–			–			–		
MEXT survey 2006 (first term) (N = 12)	4.23		3.59	–3.23		3.73	4.42	†	2.44	1.95		4.12	1.13		.87
MEXT survey 2006 (second term) (N = 12)	–14.11	**	3.59	–23.95	**	3.73	–4.72	†	2.44	14.35	**	4.12	.25		.87
MEXT survey 2006 (third term) (N = 12)	.11		3.59	–.18		3.73	–.34		2.44	.84		4.12	–.17		.87
MEXT survey 2006 (fourth term) (N = 12)	1.32		3.59	2.37		3.73	1.04		2.44	1.41		4.12	.04		.87
MEXT survey 2006 (fifth term) (N = 12)	.00		3.59	–1.40		3.73	–.21		2.44	1.49		4.12	–.16		.87
MEXT survey 2006 (sixth term) (N = 12)	1.69		3.59	–4.13		3.73	4.06	†	2.44	1.19		4.12	.64		.87
Shizuoka survey 2007 (second term) (N = 3)	–12.87	**	4.29	–31.43	**	4.46	–8.66	**	2.91	26.30	**	4.93	1.20		1.04
Shizuoka survey 2007 (third term) (N = 2)	1.90		4.70	3.64		4.89	–1.39		3.19	–.38		5.40	.13		1.14
Hokkaido survey 2008 (N = 2)	–			–			–			–			–		
AJTSU survey 2012 (N = 2)	–			–			–			–			–		
adj. R^2	.53			.73			.59			.60			.50		
($F_{[\text{the degree of freedom for between variance}],[\text{the degree of freedom for within variance}]}$)	($F_{23,186}$ = 11.41**)			($F_{23,186}$ = 25.13**)			($F_{23,186}$ = 14.14**)			($F_{23,186}$ = 14.85**)			($F_{23,186}$ = 10.09**)		

(Note) N = 210,**: $p < .01$, *: $p < .05$, †: $p < .10$, B means partial regression coefficient, *S.E.* means standard error, *adj.*R^2 means adjusted R-square, and F means F-statistics. Moreover, B = – means the parameter is equal to zero because it is lengthy.

hours per week. For junior high school teachers, the average in the 1950s–1960s was, excluding the MEXT Workload Survey 1952 less than 60 hours, while in the late 2000s and thereafter it was 60 hours or more in multiple surveys.

Next, in comparison via the general linear model, for both elementary and junior high schools the late 2000s and thereafter showed longer average working hours per week than the 1950s–1960s. As shown in Table 2 Model 1, the "Late 2000s dummy variable" (B = 14.20, p < .01) and "Junior high school teachers' dummy variable × Late 2000s dummy" (B = 5.33, p < .01) used as independent variables both showed statistically significant positive codes for dependent variables.

(2) Duties directly concerned with educational activities

Next, regarding duties directly concerned with educational activities, it was found that in the 1950s–1960s, both elementary school teachers and junior high school teachers totaled 30 hours a week or less. In contrast, most surveys in the late 2000s and thereafter showed 30 hours a week or more.

In comparison via the general linear model, for both elementary school teachers and junior high school teachers, the late 2000s and thereafter showed longer working hours directly concerned with educational activities than the 1950s–1960s. As shown in Table 2 Model 2, the "Late 2000s dummy variable" ($B = 10.70$, $p < 0.5$) and "Junior high school dummy variable × Late 2000s dummy variable" ($B = 9.44$, $p < .01$) used as independent variables both showed statistically significant effects of dependent variables.

As well, it is clear that the surveys from the late 2000s and thereafter show more hours being spent on extracurricular activities. Of the above 14 surveys, I compared 5 which were held in November and which allowed calculation of hours spent on both official classes and extracurricular activities; the results are shown in Figure 3. From Figure 3, we see that compared to the 1950s, the surveys from the late 2000s and thereafter showed longer hours spent on extracurricular activities for both elementary school teachers and junior high school teachers.

In addition, compared to the 1950s–1960s, the late 2000s and thereafter showed greater diversity among teachers' extracurricular activities. Surveys from the latter period included support and guidance for students with issues among the items investigated, which was almost nonexistent on surveys from the 1950s–1960s. Extracurricular activities indicated as investigated items in the 1950s–1960s included mainly extra subject teaching and club activity direction, that is to say activities aimed at students in groups.[13]

(3) Duties indirectly concerned with educational activities

As we see in Figures 1 and 2, regarding duties indirectly concerned with educational activities, the hours for both elementary school teachers and junior high school teachers tended to average about 12 to 15 hours per week.

Analysis through the general linear model shows no significant difference in the hours between the 1950s–1960s and the late 2000s and thereafter for either elementary school teachers or junior high school teachers. As shown in Table 1 Model 3, the "Late 2000s dummy variable" ($B = 4.24$, p = n.s.) and "Junior high school teachers' dummy variable × Late 2000s dummy variable" ($B = -1.73$, $p < .10$) regarding dependent variables both showed a statistically insignificant 5% level.

(4) Duties concerned with school management and other school affairs

Regarding duties concerned with school management and other school affairs, first, as shown in Figure 1, most surveys in the 1950s–1960s showed some 10 to 15 hours per week for elementary school teachers, while those from the late 2000s and thereafter nearly all showed 8 to 10 hours per week. For junior high school teachers, as shown in Figure 2, the 1950s–1960s surveys indicated 15 to 20 hours per week, while those from the 2000s and thereafter showed 10 hours per week or so.

Comparison through the general linear model shows no significant difference for the hours between the 1950s–1960s and the 2000s. As shown in Table 1 Model 4, the "Late 2000s dummy variable" ($B = -.33$, p = n.s.) and "Junior high school teachers' dummy × Late 2000s dummy

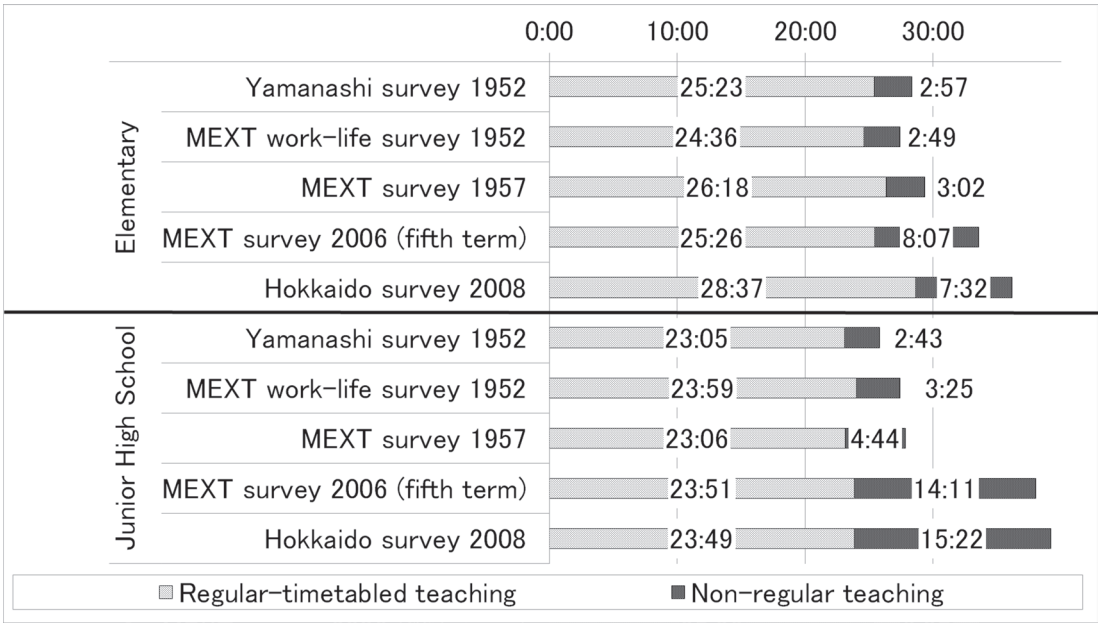

Figure 3 Individual working hours directly concerning educational activities (weekly average)

variable" (B = –2.65, p < .10) effects showed a statistically insignificant 5% level.

Further, with regard to the hours spent on paperwork and report writing on which a focus has been placed in the debate over the increasing burden of peripheral duties, a comparison between the 1950s–1960s and the late 2000s and thereafter shows that hours in the latter period were not particularly long for either elementary or junior high school teachers.

Further still, of the 14 surveys used for this analysis, a comparison of the six which were carried out in November and which allowed calculation of the hours spent on paperwork and report writing led to the results shown in Figure 4. As Figure 4 shows, the hours per week spent on paperwork and report writing in elementary schools was particularly long (3 hours) in the 2 surveys held in 1952, but only 1 hour or so in the later 4 surveys. Regarding junior high schools, the 2 surveys held in 1952 were longer than others (over 2 hours), but the later 4 surveys showed approximately 1 to 2 hours per week.

(5) Duties concerned with external affairs

Regarding duties on external affairs, first, as shown in Figure 1, elementary school teachers in the 1950s–1960s averaged an hour a week or more in all except the "MEXT survey 1957" and the "1965 Okinawa survey". As well, most of the surveys from the late 2000s and thereafter showed 1 hour or less. Elsewhere, Figure 2 shows that in junior high schools, in both the 1950s–1960s and the late 2000s, the average was 1 to 2 hours per week. Comparison through the general linear model showed no significant difference between the two periods. As shown in Table 1 Model 5, the "Late 2000s dummy variable" (B = –.41, p = n.s.) and "Junior high school dummy variable × Late 2000s dummy variable" (B = –.17, p = n.s.) used as independent variables both resulted in an insignificant 5% level for statistical results.

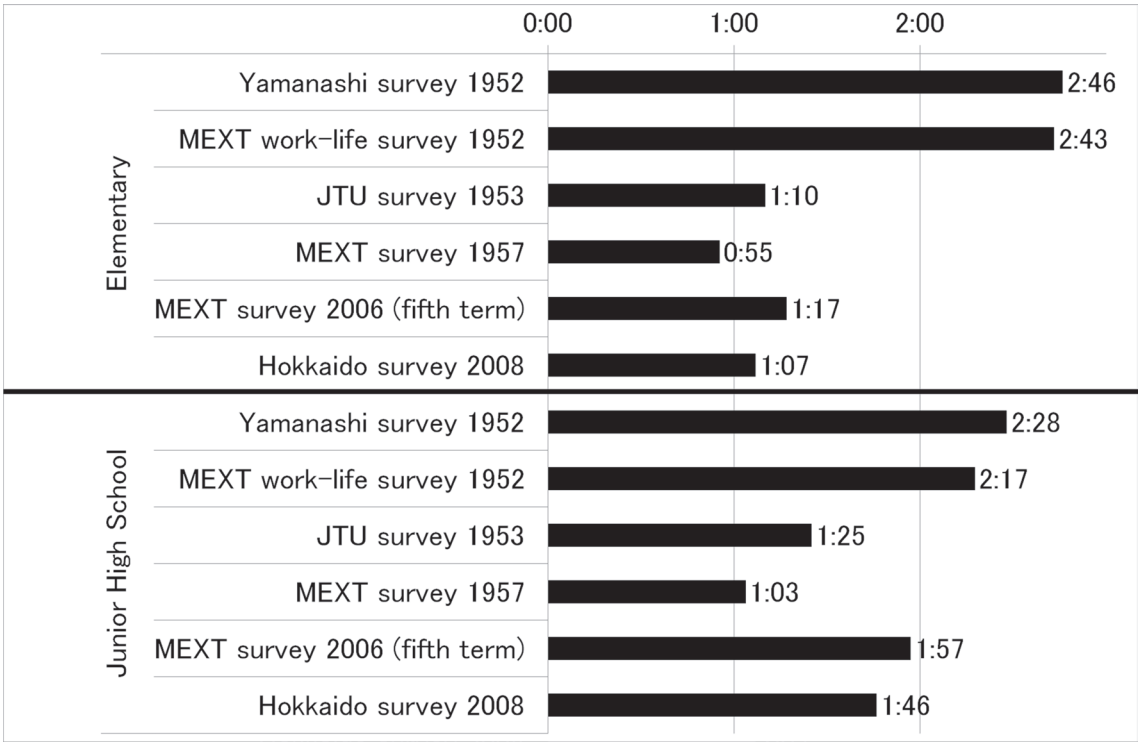

Figure 4 Individual working hours concerning paperwork/report writing (weekly average)

4. Discussion

Above, I focus on the total working hours and individual working hours of teachers in public elementary school and junior high schools in order to consider teachers' increasing workloads. Results show that teachers have become busier in recent years than in the 1950s–1960s, when the focus was on overload of paperwork. While total working hours in postwar Japan has been on a decreasing trend as a whole due to the amended Basic Labor Law and reduced hours (Ogino 2007), a characteristic of teaching labor is the trend towards increased working hours for teachers.

However, it is thought that teachers' increased workloads are due not to the quantitative increase in peripheral duties such as paperwork which has been noted, but rather to the quantitative increase and increasing diversity of educational activities, their main duties, in particular extracurricular activities.

Based on the facts of previous research as well, two major background factors for this can be considered. First, the increase in students with issues and the diversification of the issues with which students struggle. According to Yoshida (2004), the more teaching experience a teacher has the longer he or she works with student guidance, and feels that problem behaviors such as in-school violence, bullying, and truancy are increasing. As well, this analysis has shown that in recent years the contents of student guidance are becoming more diversified in comparison to the 1950s–1960s. We are thus led to observe that teachers in recent years have increasing numbers of problem incidents to cope with and also increasingly diversifying problems, so that

they become overburdened with student guidance in both quantitative and qualitative terms.

Second is the expanded role of school education. In response to the demands of society, athletic activities in schools are expanding (Nakazawa 2014), and in the form of guidance, teachers' work with students has been given educational significance in every aspect (Sakai 1998). This kind of expansion of the role of school education is thought to have expanded the educational activities demanded of teachers and increased their burdens quantitatively.

Elsewhere, it was not confirmed that peripheral duties such as paperwork are contributing in recent years to teachers' increased workloads in terms of working hours. Modern laborers who do nearly all their clerical work on the computer are known to be prone to VDT disorders due to computer work such as visual fatigue, tiredness, and sleep disorders (Iwanaga 2003). As teachers in recent years use computers for paperwork and report writing, etc., they may suffer from a qualitative burden in this area compared to their counterparts in the computerless 1950s–1960s.[14] For this reason, even if the time spent on paperwork is comparable to that in the past, it may in fact place increased burdens on teachers of today. However, because this analysis did not find a significant difference in working hours spent on paperwork in the 1950s–1960s and in recent years, and from the indications that teachers have been overburdened with paperwork duties since the 1950s–1960s at least, it is worth noting that the overload of paperwork duties on teachers has been a consistent problem.

Based on the above, the increasing workloads of teachers in Japan are concluded to be due to the diversification and quantitative expansion of extracurricular activities. Existing debates on the increasing burdens on Japanese teachers have pointed out the reduction of time spent with children due to increased peripheral duties. However, in actual fact, teachers have if anything expanded the time spent with children, centering on extracurricular activities.

Further, given these facts, the following points can be deduced with regard to forthcoming educational practices and research into teachers' workloads. First, with regard to educational practice, in order to reduce the overburdening of busy Japanese teachers, there is a need to reassess teachers' educational activities themselves. The recent focus has been on securing time spent with children, but a poorly thought out approach will simply make teachers ever busier. For this reason, it is more necessary than ever to relieve teachers' workloads in their educational activities themselves, the main part of their work, at the level of educational authorities and school management, from the perspective of "what is the education and guidance which the school and the teachers can handle?".

Next, with regard to research into teachers' workloads, there are two points to consider. First, compared with the factors regulating overseas teachers' workloads, Japanese case studies are distinctive. Research has accumulated on teachers' overburdening in the West as well, pointing out the expansion of teachers' clerical duties due to educational reforms (Smylie 1999 etc.). In contrast, we have confirmed in Japan the expansion not of paperwork but of extracurricular activities. Further, from actual data research in recent years using TALIS2013 data, it has been found that while in other countries teachers have greater job satisfaction the more time they spend on counseling and other individual student guidance, in Japan this tends to lead to lower job satisfaction (Kanbayashi 2015). Given these points, the effect on teachers' workloads of the existence of educational activities is undeniable in Japan, unlike in other countries.

In related issues, we have the second point, the need for a reconsideration of research into overseas teachers' workloads. Recently, in the UK as well, Ofsted (Office for Standards in Education) has introduced school evaluations, due to which educational policy is dealing with

the issue of increased clerical duties (Department for Education 2014). However, as far as I can tell, there has been effectively no research into the changing working hours of teachers in the UK by individual categories such as this paper carries out. The policy debate in the UK is focused entirely on the increased burdens of teachers' clerical duties, just as in that discussed above in Japan. Therefore, by carrying out a reconsideration of the shifts in teachers' total working hours and individual working hours as this paper does, it might be possible to find new information indicating that it is not peripheral duties such as paperwork which have expanded but the workload of educational activities themselves. It will be necessary in future to accumulate actual data research on total working hours and individual working hours for overseas teachers as well.

Finally, in reference to topics for discussion from here on, I want to suggest a clarification of the reason why the time spent on educational activities, in particular extracurricular activities such as student guidance, has expanded for teachers in Japan. With a focus on the system of labor laws and educational curricula in which teachers are enmeshed, I hope to approach the background to teachers' workloads in future.

Additional Note

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Notes

1. Refer to *On Schools as Teams and Methods of Future Improvements (Midterm Outline)*, MEXT Central Educational Council Working Group on Schools as Teams/How Teachers Should Be (16 July 2015). Further, in the West, schools are increasingly hiring assistant guidance staff who handle the clerical work heretofore done by teachers, adding specialist staff like social workers and special education teaching aides (Research Association for Overseas Teachers' Salary ed. 2007), and the "Schools as Teams" policy discussion has referred to these approaches.
2. In the 1950s, a comparison of working hours for Japanese and American teachers showed that Japanese teachers spent more hours on duties other than guidance and were overburdened with clerical work (Miyaji 1954). As well, in the 1960s, the school management modernization which later became famous for the multilevel/single-level structure debate on school organization was being promoted, with the overburdening of teachers through paperwork and busywork in its background (Ito 1963).
3. Below, I refer to the entire hours spent at work by teachers as total working hours, and to its component parts, spent respectively on various duties, as individual working hours.
4. While working hours is only one index of teachers' workloads, it is an important one with reference to the influence on their physical and mental health. With regard to physical health, the longer overtime teachers work, the more they tend to complain of tired hands and similar physical stress (Okatoh/Suzuki 1997), and with regard to mental health, the trend toward teacher burnout in those working long overtime hours has been proven (Misawa 2012).
5. Specifically, the following 14 surveys: Kyoto Prefecture Labor Economics Research Institute "Teachers' Work Survey 1950", Kanagawa Prefecture Educational Research Institute "Actual Teaching Activity Survey 1950," MEXT "Teacher Workload Survey 1952," Yamanashi Prefectural Board of Education "Teachers' Work-life Survey 1952," MEXT "Teachers' Work-life Survey 1952," Iwate Prefectural Board of Education "Teaching Staffs' Workload Survey 1952," Japan Teachers Union (JTU) "Actual Teaching Activity Survey 1953," MEXT "Teaching Staffs' Workload Survey 1957," Naha Educational Research Institute "Teaching Staffs' Workload Survey 1965 in Okinawa," MEXT "Teaching Staffs' Workload Survey 1966," MEXT "Teachers' Actual Working Hours Survey 2006" (Terms 1 through 6), Shizuoka Prefectural Board of Education "Teaching Staffs' Actual Working Hours Survey 2007" (Terms II and III), Hokkaido Prefectural Board of Education "Teaching Staffs' Overtime Survey 2008," All-Japan Teachers and Staffs Union (AJTSU) "Teachers'

Appendix Table 1 Results of Japan Teachers' Union Survey 1953

	Work classification	Average daily work working hours among 5 days (from Monday to Friday)	Average daily work working hours on Saturday	Average daily work working hours on Sunday
Elementary School Teachers	A	292	215	19
	B	106	85	49
	C	134	117	99
	D	16	18	16
	Total	548	435	183
Junior High School Teachers	A	266	271	50
	B	113	85	51
	C	147	140	116
	D	20	19	32
	Total	546	515	249

(Source) Japan Teachers' Union Research Section (1954)
(Note)
A means the category of educational activities (regular timetabled and non-regular), B means the category of planning, preparation , class management and assessment. Moreover, C means the category of school management, and D means the category of contact with parents, local residents and boards of education.
The units of the figures in this table are minutes. "

Actual Working Hours Survey 2012".

6. It would be ideal to compare total working hours and individual working hours based on individual data, but as far as I can ascertain, individual responses have not been released for past surveys.
7. Regarding the Yamanashi Survey 1952, Work-life 1952, the JTU survey 1953, and the MEXT survey 1957, the average weekly working hours can be calculated based on publically released aggregate results.

   However, for the other surveys, calculation of average weekly working hours based on publically released results is difficult. For the 1950s–1960s surveys to which this applies, I calculated the average weekly working hours based on the JTU survey 1953 results, weighting the working hours for each survey. For example, for the the MEXT workload survey 1952, the average working hours for a 6-day Monday-Saturday week for an elementary school teacher were released, and the hours spent on "duties directly concerning educational activities" was 5.327 hours. From this, based on attached table 1, I calculated the average weekly working hours as follows:
   Average weekly working hours = 5.327 (hours) × 6 × ((292 × 5 + 215 + 19) / (292 × 5 + 215)) = 32.326 (hours) ≒ 32 hours 20 minutes

   As well, the weekly average working hours for the surveys from the late 2000s and after were calculated as the sum of 5 days worth of daily average work hours for weekdays and 2 days worth of daily average work hours for holidays. In addition, for the AJTSU survey 2012, only the daily average work hours for weekdays were released. Therefore, the working hours for a holiday for this survey are calculated in proportion to the weekday and holiday averages for the MEXT survey 2006 from the same period (refer to attached table 2). The weekly average working hours were then calculated by the method indicated above.
8. The meaning of "indirectly" as used in "duties indirectly concerned with educational activities" in the MEXT survey 2006 can be said to be close to the "educational activities by indirect methods of comments on hand-ins" rather than direct educational activities to children referred to by Oikawa (2009).

Appendix Table 2 Results of MEXT Survey 2006 (4th Term)

	Work classification	Average daily work working hours among 5 work days (from Monday to Friday)	Average daily work working hours on holidays(Saturday and Sunday)
Elementary School Teachers	A	6:51	0:11
	B	2:26	1:12
	C	1:47	0:20
	D	0:07	0:07
	Total	11:13	1:52
Junior High School Teachers	A	7:02	2:04
	B	2:31	0:55
	C	1:39	0:21
	D	0:09	0:05
	Total	11:22	3:25

(Source) the University of Tokyo (2007)
(Note)
A means the category of educational activities (regular timetabled and non-regular), B means the category of planning, preparation , class management and assessment. Moreover, C means the category of school management, and D means the category of contact with parents, local residents and boards of education."

Further, the categories used in the MEXT survey 2006 were based on reference to the MEXT survey 1966 (the University of Tokyo 2007: p.24), but as with these surveys, the MEXT survey 1957 also uses "duties indirectly concerned with educational activities" to refer to class preparation and grading. In these MEXT surveys, class preparation and grading have been categorized under the larger rubric of "duties indirectly concerned with educational activities."

9. For the general linear model, see Grafen and Hails (2002).
10. For example, in the MEXT workload Survey 1952, elementary school teachers were divided into 12 categories by gender, by age (4 divisions), by whether or not they were homeroom teachers, and by school size (4 divisions), and junior high school teachers were divided by gender, totalling 14 categories in the aggregate data released. This analysis uses these 14 categories as simulated individual data for the aggregate results; that is, for the MEXT workload survey 1952, there are 14 samples used in the analysis, so that the name of the survey in Table 2 has N = 14 appended. Similar procedures were used with other surveys. For the number of categories used in the aggregate results for analysis data for each survey, see the sample numbers with the survey names in Table 2.
11. The "Late 2000s dummy" is 1 for the late 2000s and thereafter, and 0 for the 1950s–1960s. The "Junior high school teachers' dummy × Late 2000s dummy" is a reciprocal effect item with the dummy above and the "Junior high school teachers' dummy" (see note below).
12. "Survey ID" is a category variable for identifying the 14 surveys used in this analysis, controlling for the influence of survey region on total working hours and individual working hours. Here, the reference variable is the most recent survey in the data, the "AJTUS survey 2012" As well, the MEXT survey 2006 covers 6 terms and the Shizuoka survey 2007 covers 2, so each of these has an ID per term.

    The "Junior high school teachers' dummy" is 1 for junior high school teachers' results and 0 for elementary school teachers' results. "Gender" is 0.5 for results including male teachers only, 0 for results combining male and female teachers, and –0.5 for results including female teachers only. "Homeroom teachers' variable" is 0.5 for homeroom teachers' results, 0 for homeroom teachers and others combined, and -0.5 for others only. "Novembers' survey dummy variable" is 1 for surveys carried out in November (a period with relatively few school events) and 0 for others.

13. Extracurricular activity items on surveys include the "spontaneous educational activities" item on the MEXT work-life survey 1952: "subject or extra-subject activities carried out spontaneously or at the request of children or parents", and examples such as club activities, supplementary classes, and outside guidance of the "extracurricular activities guidance" on the MEXT survey 1957. However, in the MEXT survey 1966 used for reference in the survey items of the MEXT survey 2006, counseling guidance is given as an example of extracurricular activities.
14. The MEXT work-life survey 1952 includes "printing and binding duties" in its duty categories, which includes mimeographing and typing; this leads us to conclude that teachers' paperwork duties at the time involved handwriting or typing.

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