Social Capital and Meritocracy: Civil Service Examinations in China, 1400-1580
Extended abstract for SSHA annual meeting, 2021

Since Michael Young (1958) coined the term "meritocracy," it has become an ideal institution that rewards power and prestige based exclusively on individual ability and talent, regardless of ascriptive factors. Long before Young's discussion of meritocracy, from 605 to 1904 China had institutionalized a political elite recruitment system that selected talented men based on their performance on the civil service examinations (CSEs) rather than family background, often regarded as the earliest and most elaborate meritocratic institution. Regarding the fulfillment of this goal, there are two seemingly contradictory views. One argues that the CSE system enabled upward mobility through open competition, as evidenced by a large proportion of students who passed the CSEs from commoner families (Kracke 1947, 1953; Ho 1964). The other view challenges this high mobility thesis and is attentive to broader criteria such as family wealth and the CSE achievement of the extended families such as maternal and paternal uncles (Hymes 1987; Hartwell 1982).

To address this debate and explore the mechanisms of whether and how family background mattered for the CSE outcome, we employ a unique dataset of 12,427 students who passed the 46 CSEs between 1400 and 1580 (records on some CSEs during this period were not complete and excluded from analysis). It is well established that the Ming dynasty (1368–1644) represents the heyday of the CSE institution. Among others, two institutional designs make this period an effective testing ground. For one thing, merit was exclusively defined as academic competency during this period to further leveling the field for commoners to advance. This was in sharp contrast to the previous dynasties with a broader examination content. Despite many drawbacks, a narrowing merit makes evaluation straightforward and transparent, leaving less discretion for examiners and other stakeholders.

For another, although anonymous evaluation as a measure to uphold meritocracy was introduced in the Song dynasty, strict yet selective enforcement of anonymity embedded in a three-sequence examination system in the Ming dynasty provides a quasi-experimental setting to test the relative effect of merit and family background on CSE outcomes. More specifically, all the Ming dynasty students had to take a triennial provincial examination in their provincial capital city in August, competing with others from the same province. If they passed, they would then be allowed to take the national level metropolitan examination (ME) in Beijing in the following February, competing with a national pool. It is in the MEs that meticulous rules were developed to ensure anonymous evaluation (Elman 2013: 227). If they passed MEs, they would then take the non-eliminating palace examination (PE) in March, which was not anonymously graded. After the PEs, they were granted the highest academic honor and became eligible for an official position in bureaucracy. Thus, for all the students who passed the PEs, they were in fact tested twice within one month apart, whose exam performance was ranked in comparison to the same pool of competitors.

Taken together, if anything, we expect that the overall characteristics of the Ming dynasty CSE feature a meritocratic channel, in which academic competence mattered for the outcome. However, given that "the examination life like death and taxes, became one of the fixtures of elite society and popular culture" (Ho, 1964: 128), it is reasonable to anticipate the effects of

family investment, direct influence, or tacit knowledge spillover too. In light of anonymous evaluation in the MEs, we also expect that family influence, if any, would be more likely during the PEs.

Guided by this broader conceptualization, we test the relative effects of academic competence and family influence on students' relative rankings. In terms of methodology and data, because the data only covered the students who passed the CSE, a meaningful variation is their relative rankings. Therefore, for our *dependent variables,* we reserve code and standardize the rankings (1-100) for ME and PE performance to make interpretation straightforward. In terms of *independent variables*, we capture family influence through two channels: social capital and cultural capital. Admittedly, these two were related in a society whereby success was dominated by passing the CSEs. Some unique historical information enables us to make a conceptual distinction though. We define *cultural capital* as the number of brothers being intellectuals— those either already passed the CSEs themselves or admitted in dynasty schools preparing for the CSEs. We define social capital as the bureaucratic ranks (0-20) of a student's father. Additionally, we also use the same construct of bureaucratic ranks by the three preceding generations (great grandfather, grandfather, and father) to construct a latent variable of intergenerational social capital with 5 categories: no, fast accumulated, steadily accumulated, hereditarily high, and decreasing. We address human capital or academic competence in two ways. One proxy is reverse coded age. To some extent much of the examination content is rote memorization and mechanical regurgitation of existing knowledge. Younger students presumably should be more academically competent to outperform the older peers. In the dataset, age range is between 13 and 59. Given that CSEs were organized triennially, we reserve-code and standardize age as (59-age)/ (59-13) to provide a more straightforward interpretation. The other proxy is being in imperial academy, with presumably better education resources. In terms of financial capital, we count the number of wife and concubines a student had (0-5) in the absence of any systematic tax or property information. We control for a few variables too: household registration, provincial origin, and exam specialty, etc.

Our main results come from two sets of mixed-effect OLS regression models estimated in Stata (version 14.2) to explain performance variations in the ME and PE performance, respectively. Each set of models examines effects of human capital, social capital, and cultural capital on exam performance after controlling economic background, household registration, school attended, and other contextual factors. To address the hierarchical nature of our data, each set of models is configured to embed students into 46 examination years (in each examination year, the effect of examination subjects is treated as a random factor) and to embed examination years to the reign of 12 emperors. Finally, we calculate and introduce cubic spline variables of provincial examination performance to models of ME performance as well as the ME performance to models of PE performance to better control nonlinear variations.

Models A1 to A4 in Table 1 suggest human capital measured by academic competence and being an Imperial academy student, is a significant (p<0.001) predictor of the PE performance. All else being equal, higher academic competence increases the PE performance; compared to others, students from the Imperial academy tend to have better PE performance. This finding strongly supports the meritocracy thesis. Throughout these four models, cultural capital measured by number of brothers being intellectuals is not statistically significant. With respect to the effect of

social capital, Model A1 shows that the bureaucratic ranking of a student's father exerts positive effect on the PE performance (0.472, p<0.001). In comparison with those whose fathers were not officials (social capital=0), those from high social capital families (maximum vague of 20) tend to be moved 9 places up on PE rankings in a pool of 100 competitors (coef. = 9.44), which is a huge advantage after holding all other effects constant and in an actual average pool of 288 (i.e., $9.44 \times 2.88 \approx 27$). Social capital remains to be a significant predictor (coef. = 0.443, p<0.001) in Model A2 where we further consider the mobilization or activation of social capital, proxied by whether a student's father was alive at the time him taking the exam. Our results show that resource mobilization through social capital is not the case here as the dummy variable of father was alive when taking the examination (reference = "No") and its interaction with father's official rank (OR) are not significant.

To be sure, the family-centered social capital can be accumulated across generations. We explore the effects of different patterns of intergenerational mobility by combining three preceding generations' official rankings in Model A3. Compared to the reference group of no intergenerational accumulation (e.g., none of the three preceding generations ever served in bureaucracy), students from fast accumulated (coef. = 3.948, p<0.001), steadily accumulated (coef. = 3.384, p<0.001), and hereditarily high (coef. = 8.201, p<0.001) families tend to achieve higher PE performance. The Chi-square test (χ^2=56.94, p<0.001) shows that there is a significant joint effect of intergeneration accumulation of social capital on PE performance. This result remains robust after introducing measures of social capital mobilization to the Model A4. The only difference is that a student from a fast accumulated family can only enjoy this advantage when his father was alive when taking the examination (coef. = 4.555, p<0.05 and the χ^2=9.67, p<0.05 further confirming this conclusion), even if the main effect of "father was alive" in this interaction is insignificant. Social capital mattered greatly for a student's PE performance, largely regardless of whether it was mobilized or not.

Table 2explains the ME performance by using the same set of independent variables and it reveals some very different patterns. Like the findings from Table 1, two human capital measures in Models B1 to B4 are significant (p<0.001) and positive predictors of the ME performance, again portraying a meritocratic view of CSEs. Except for this similarity, we see more difference as we have expected for the effect of anonymous evaluation. First, cultural capital is significant in all four models (p<0.01). Second, there is no significant impact of social capital on ME performance in all four models, no matter whether we use the information on father's bureaucratic experience or that of three preceding generations. For example, in Model B3, there is a significant and positive effect (coef. = 2.265, p<0.05) of fast accumulated social capital on ME performance. However, the insignificant Chi-square test (χ^2=4.93, p>0.05) implies that there is no joint effect of intergenerational social capital on ME performance. Finally, there is no significant effect of social capital mobilization in any one of the four models.

In a nutshell, CSEs as an institution for selecting political elites was reasonably meritocratic in that human capital had a consistent and positive effect on ME and PE performance. The selective adoption of strict anonymous evaluation procedures in the MEs but in the PEs, however, was consequential. Social capital and its mobilization did not affect the ME scores. In contrast, cultural capital proxied by brothers' academic achievement was positively related to ME performance, which could be further explored for the mechanisms such as peer effect or tacit

knowledge diffusion. For the PEs, there emerged an opposite trend with positive social capital and no effect for cultural capital. This suggests that the final stage of CSEs was less meritocratic, and susceptible to one's family background.

Bibliography

Ho, Ping-ti. 1964. *The Ladder of Success in Imperial China: Aspects of Social Mobility, 1368-1911*. New York: John Wiley & Sons, Inc.

Hartwell, Robert M. 1982. "Demographic, Political, and Social Transformations of China, 750-1550." Edited by Michael Dillon. *Harvard Journal of Asiatic Studies* 42 (2): 365–442.

Hymes, Robert. 1987. *Statesmen and Gentlemen: The Elite of Fu-Chou Chiang-Hsi, in Northern and Southern Sung*. Cambridge: Cambridge University Press.

Kracke, Edward A. Jr. 1947. "Family Vs. Merit in Chinese Civil Service Examinations Under The Empire." *Harvard Journal of Asiatic Studies* 10 (2): 103–23.

———. 1953. *Civil Service in Early Sung China, 960-1067: With Particular Emphasis on the Development of Controlled Sponsorship to Foster Administrative Responsibility*. Cambridge: Harvard University Press.

Young, Michael Dunlop (1958). *The Rise of the Meritocracy*. Thames and Hudson.

Table 1 Mixed effect OLS regression models of the PE performance

	(A1)	(A2)	(A3)	(A4)
Human Capital				
Academic competence	1.571***	1.432***	1.588***	1.449***
	(0.270)	(0.283)	(0.270)	(0.283)
Imperial academy student [a]	1.862***	1.838***	1.899***	1.867***
	(0.547)	(0.547)	(0.547)	(0.547)
Social Capital				
Father's official ranking (OR)	0.472***	0.443***		
	(0.058)	(0.087)		
Intergenerational social capital (ISC)[a]				
Fast accumulated			3.948***	1.349
			(1.118)	(1.701)
Steadily accumulated			3.384***	4.757***
			(0.813)	(1.240)
Hereditarily high			8.201***	8.389***
			(1.333)	(1.978)
Decreasing			0.583	-1.250
			(0.961)	(1.506)
Joint χ^2 test of ISC (χ^2value)			**56.94*****	**32.56*****
Social Capital Mobilization				
Father was alive when taking exam [a]		0.734		0.629
		(0.611)		(0.630)
Father was alive x OR		0.0536		
		(0.112)		
Father was alive x ISC				
Yes x Fast accumulated				4.555*
				(2.226)
Yes x Steadily accumulated				-2.392
				(1.629)
Yes x Hereditarily high				-0.325
				(2.527)
Yes x Decreasing				3.066
				(1.933)
Joint χ^2 test of father alive x ISC				**9.67***
Cultural Capital				
# of brothers being intellectuals	0.792	0.823	0.886	0.930
	(0.496)	(0.496)	(0.496)	(0.497)
Control of Economic Inequality				
# of wife + concubine(s)	-1.523*	-1.498*	-1.553**	-1.501*
	(0.599)	(0.599)	(0.599)	(0.599)
Constant	47.14***	46.70***	47.27***	46.89***
	(1.431)	(1.481)	(1.434)	(1.483)

Note: N=12,427 embedded in 46 exams; Student's household registration types, exam specialty, and provincial origins omitted; Three cubic spline of Metropolitan Exam performance omitted; [a]: Reference group = No; Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05

Table 2 Mixed effect OLS regression models of the ME performance

	(B1)	(B2)	(B3)	(B4)
Human Capital				
Academic competence	1.902***	1.829***	1.885***	1.809***
	(0.269)	(0.283)	(0.270)	(0.283)
Imperial college student [a]	3.280***	3.267***	3.272***	3.255***
	(0.553)	(0.553)	(0.553)	(0.553)
Family Social Influence				
Father's official ranking (OR)	0.0894	0.0505		
	(0.0583)	(0.0867)		
Intergenerational social capital (ISC)[a]				
Fast accumulated			2.265*	0.330
			(1.115)	(1.696)
Steadily accumulated			0.0132	1.584
			(0.812)	(1.237)
Hereditarily high			1.260	1.054
			(1.330)	(1.973)
Decreasing			0.659	1.194
			(0.960)	(1.502)
Joint χ^2 test of ISC (χ^2 value)			**4.93**	**2.17**
Mobilizability of Family Influence				
Father was alive when taking exam^		0.262		0.616
		(0.610)		(0.628)
Father was alive x OR		0.0698		
		(0.112)		
Father was alive x ISC				
Yes x Fast accumulated				3.403
				(2.219)
Yes x Steadily accumulated				-2.727
				(1.624)
Yes x Hereditarily high				0.381
				(2.519)
Yes x Decreasing				-0.896
				(1.926)
Joint χ^2 test of father alive x ISC				**5.97**
Cultural Capital				
# of brothers being intellectuals	1.557**	1.571**	1.517**	1.510**
	(0.498)	(0.499)	(0.499)	(0.499)
Control of Economic Inequality				
# of wife + concubine(s)	-0.429	-0.418	-0.439	-0.422
	(0.600)	(0.600)	(0.600)	(0.600)
Constant	50.75***	50.60***	50.75***	50.43***
	(1.595)	(1.635)	(1.596)	(1.640)

Note: N=12,427 embedded in 46 exams; Student's household registration types, exam specialty, and provincial origins omitted; Three cubic spline of Provincial exam performance omitted; [a] Reference group = No; Standard errors in parentheses. *** p<0.001, ** p<0.01, * p<0.05