

# Intergenerational mobility through inhabited meritocracy: Evidence from civil service examinations of the early- and mid-Ming dynasty

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## Abstract

The civil service examination system emerged to strengthen the emperor's power by recruiting political elites through open examinations. Did it, during the early- and mid-Ming dynasty, facilitate intergenerational mobility? Rather than oversimplifying it as a single-stage system of meritocracy, we propose a two-stage evaluation framework. In the first stage, the Metropolitan Exam featured merit-based evaluations and generated credentials necessary for becoming political elites. The subsequent non-eliminating Palace Exam then functioned to assess the students' organizational fit in line with an emperor's political calculations. In particular, those whose families served in the bureaucracy were favored, while those from affluent families were discriminated against. We test this two-stage framework using the records of 12,427 students who passed 46 exams between 1400 and 1580, a period characterizing the heyday of this system. Our empirical findings from the mixed-effect regression models confirm this argument and suggest promising directions for future research.

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## RÉSUMÉ

Le système d'examen de la fonction publique est apparu pour renforcer le pouvoir de l'empereur en recrutant des élites politiques par le biais d'examens ouverts. A-t-il, au début et au milieu de la dynastie Ming, facilité la mobilité intergénérationnelle ? Plutôt que de le simplifier à l'extrême comme un système de méritocratie à une seule étape, nous proposons un cadre d'évaluation en deux étapes. Au premier stade, l'examen métropolitain comportait une évaluation fondée sur le mérite et permettait d'obtenir les qualifications nécessaires pour devenir des élites politiques. L'examen du palais, non éliminatoire, permettait ensuite d'évaluer l'aptitude organisationnelle des étudiants en fonction des calculs politiques de l'empereur. En particulier, ceux dont les familles travaillaient dans la bureaucratie étaient favorisés, tandis que ceux issus de familles aisées étaient discriminés. Nous testons ce cadre en deux étapes en utilisant les dossiers de 12 427 étudiants qui ont passé 46 examens entre 1400 et 1580, une période qui caractérise l'apogée de ce système. Les résultats empiriques de nos modèles de régression à effets mixtes confirment cet argument et suggèrent des directions prometteuses pour la recherche future.

## INTRODUCTION

Coined and initially criticized by [Young \(2017\[1958\]\)](#), “meritocracy” as a screening and rewarding institution has become a widely accepted ideology ([Mijis, 2019](#)) to promote merit-based distributive justice. In theory, meritocracy is crucial in intergenerational social mobility as we proceed to a credential-based post-industrial society, in which education plays a key role in defining merit. Ideally, the development of meritocracy weakens the relationship between one's class origin (O) and educational attainment (E), strengthens the association between E and class destination (D), and eliminates the deterministic power of O on D over time ([Bell, 1972, 1973](#)). However, empirical studies provide inconsistent evidence in post-industrial societies, such as the persisting O-D link (see [Markovits, 2019](#); [Pfeffer & Hertel, 2015](#) as examples) and O-E association (see [Fiel, 2018](#); [Mortimer et al., 2017](#) as examples) across generations in the United States and the weakening ([Breen & Goldthorpe, 2001](#); [Goldthorpe, 2014](#)) and contingent ([Goldthorpe, 2003](#)) E-D path in the United Kingdom. There is no easy response to these challenges given the complexity of post-industrial societies, such as flourishing choices and limited access to sensitive information. Fortunately, we develop a theory to address a very similar challenge in a less complicated

pre-modern context by showing how the merit-based civil service examination (CSE) system (*keju*, 科举) facilitated intergenerational mobility in China's early- and mid-Ming dynasty between 1400 and 1580. Our findings could be inspiring to better theorize how meritocracy influences intergenerational mobility in the post-industrial setting.

Long before the Western industrialization, imperial China institutionalized the CSE to recruit government officials from candidates of different family backgrounds via rigorous open examinations. Scholars in the field of Chinese history debated for decades on whether and how much the CSE accelerated social mobility. On one hand, prior research confirmed that the CSE enabled talented people from ordinary families to achieve upward mobility (Ho, 1964; Kracke, 1947, 1953). On the other hand, studies contended that the CSE was an elite-reproduction system at large (Hartwell, 1982; Hymes, 1987). Informed by the nuanced historical accounts of the CSE institution (Elman, 2000; Elman, 2013), we argue that treating the CSE as a two-stage evaluation system could help reconcile these seemingly inconsistent views.

We believe that two sequential national examinations underscored two separate mechanisms of generating credentials and assessing organizational fit, respectively. In the metropolitan examination (ME) (*huishi*, 会试), institutional rules such as anonymous evaluation were implemented to uphold an ideal meritocracy, and passing it was largely predicted by merit. As such, we characterize the ME as a credential-generating mechanism that legitimized the merit-based social mobility and institutionalized credentialism (Collins, 1979; So, 2015). The subsequent non-eliminating palace examination (PE) (*dianshi*, 殿试) was not anonymously graded. Instead, family background was factored into the assessment of organizational fit (Brown et al., 2016), which in our setting prioritized those from families with high social capital, but surprisingly discriminated against those with high economic capital.

To test our argument, we employ a unique dataset of 12,427 students who passed 46 CSEs between 1400 and 1580. This historical period captures the heyday of the CSE (Elman, 2000, 2013; Ho, 1964), and the reserved historical archives of students in this period were available for us to link CSE outcomes to economic, cultural, and social capital within and across generations. Specifically, vital records of a student's parents facilitated causal inferences of social capital mobilization in addition to the availability of social capital per se—a crucial issue in the vast literature on social networks and the labor market (Lin, 2001a, 2001b).

The remainder of this article is organized as follows. We first review the literature on intergenerational mobility, followed by a new two-stage analytical framework of evaluation in labor markets through generating credentials and assessing organizational fit. Next, we describe data and methods and present empirical findings from mixed-effect regression models. We conclude by summarizing contributions, limitations, and future research.

## MERITOCRACY IN INTERGENERATIONAL MOBILITY<sup>1</sup>

Meritocracy is universally pursued when selecting and rewarding talent based on individual merit instead of family background in modern societies (Liu, 2015; Wall, 2018). During the screening process of education and skills, merit-based hiring determines intergenerational mobility, which is understood as “the extent and pattern of association between parents' and adult children's socioeconomic standing” (Torche, 2015: 343). Meritocracy has increasingly become institutionalized as modern societies put heavier emphasis on achieved attributes over ascribed factors (Blau & Duncan, 1967), so that meritocracy as the integral to modernity will encompass more members into an open social structure. Ideally, merit should exclusively determine one's social status and

function as the sole channel of intergenerational mobility. Nevertheless, this optimistic perception oversimplifies the merit evaluation process that governs intergenerational mobility through two paths in modern Western societies. One path is the innate inequality of family resources in the forms of economic (Breen & Goldthorpe, 2001; Kourtellos et al., 2020), cultural (Bourdieu, 1986), and social capital (Coleman, 1988) determining the production of their children's merit. The other path is that family resources could interfere directly with the definition and evaluation process of merit, an issue largely passed over by extant literature (Karabel, 2005).

## Family resources and merit production

Merit develops in concrete local contexts of financial, cultural, and social capitals. The research represented by the Becker-Tomes-Solon (BTS) framework of human capital development (Becker & Tomes, 1979, 1986; So, 2015; Solon, 1999; Son et al., 2011; Spence, 1973) investigated how family resources facilitate children's merit production. The BTS framework assumed that rational parents would invest in their children's merit production (Cunha & Heckman, 2009; Cunha et al., 2010; Guner, 2015; Heckman & Mosso, 2014; Mogstad, 2017), which would then be positively rewarded by obtaining credentials, getting decent jobs, and securing status (Blau & Duncan, 1967; Brown et al., 2016; Collins, 1979; Flemmen et al., 2017; Hu & Vargas, 2015; Schultz, 1960; Spence, 1973; Stiglitz, 1975; Wu, 2017). Under this framework, family resources affected intergenerational mobility indirectly through unequal investments in their children's merit development. For example, richer parents invested more and earlier in their children's education (Kourtellos et al., 2020). Consequently, these advantages were transformed into access to more selective educational institutions (Chetty et al., 2020). As credentials granted by education become a prerequisite for important positions in modern societies, economic capital thus reproduces the *status quo* through education (Alon, 2009; Raftery & Hout, 1993). Under this general trend, research found that the lack of intergenerational mobility was more severe in OECD countries with greater economic inequalities (Corak, 2020). In Confucian societies, parents' economic resources played a similar role, but in a less deterministic manner (Chu et al., 2020; Gong et al., 2012; Sun et al., 2021; Yuan, 2017). Part of the reason is the "exam-centered meritocracy" (So, 2015), which induced parents of all social spectrums to invest aggressively in their children's education and thus partially curtailed the direct influence of economic capital on generating credentials.

The BTS model also touched on ideas of cultural and social capital. In this framework, cultural capital was similar to Bourdieu's (1986) embodied and objectified cultural capital, which refers to long-lasting dispositions or habitus and cultural artifacts, respectively. For example, some elite parents pass their interests in arts to their children by frequently visiting museums or listening to operas as the family habitus. Their children raised in this environment know well about the elite culture and could converse naturally with gatekeepers (e.g., college admissions officers) who share the same habits (Kaufman & Gabler, 2004). Another example would be that the books chosen by parents foster curiosity and willingness for young children to investigate complex intellectual problems as they grow up (Tanaś, 2021). In general, children from families rich in cultural capital were more likely to develop perseverance, self-esteem, self-efficacy, self-control, and stronger educational aspiration (Cunha & Heckman, 2009; Cunha et al., 2010; Mortimer et al., 2017), and to achieve challenging goals (Scherger & Savage, 2010).

In terms of social capital, Becker and Tomes' (1979) term of "connections" of their families" refers to it, understood as the productive benefits derived from structures and resources of network connections and affiliations (Baker, 1990, 2000; Bourdieu, 1986; Burt, 1992; Coleman, 1988, 1990;

Granovetter, 1973, 1985; Lin, 2001a, 2001b; Putnam, 2000). With regard to merit production, it is instinctive for any parent to help their children enroll in the best schools within their reach. With parents as alumni, a child's chance of being admitted is higher than peers without such connections (Hurwitz, 2011).

Taken together, prior research lent support to the first path that even in a merit-based society, family resources still matter for intergenerational mobility through merit production. Of course, the influence of family resources does not necessarily challenge the ideal of meritocracy. But it calls for a more nuanced understanding of the specific context and mechanism that sustains or undermines meritocracy in practice.

## Family resources and merit evaluation

While prior research focused on innate and learned merit variation, as mentioned above, less attention has been directed to how families, especially the most influential ones, may directly interfere with the merit evaluation process.

Extant studies in Western societies show that by changing the evaluation criteria and by redefining merit and its measures (e.g., leadership versus math skills) (Lareau & Weininger, 2003), meritocracy can systematically favor certain social groups in the formal educational system (Barg, 2015). This suggests that the merit we observe and develop has already reflected the influence of family resources in safeguarding a particular evaluation system, rather than mere individual effort and raw intelligence (Lareau & Weininger, 2003). These investigations bring in the concept of credentials, such as diplomas, certificates, prizes, or degrees obtained from the formal education system (Allen, 2021; Collins, 1979), and capture our attention on how powerful and influential social actors determine what credentials would be considered in merit evaluations (Križaj & Doupona, 2021).

In addition to the path from merit to credentials mediated by family background, organizational fit, as a subtle criterion in the labor market, is another mechanism to bring non-merit family background into merit evaluations. Organizational fit refers to a comprehensive assessment of one's compatibility with the employer, including both merit and non-merit factors (Chan et al., 2017; Chan & Yeung, 2020; Saunders & Zuzel, 2010). For example, princeling hires are not unusual in the financial sector, where social contacts with gatekeepers matter greatly (Bian & Zhang, 2014; Chen & Volker, 2016; Earle & Cava, 2018). And among equally qualified job candidates, those who grew up in a context similar to the interviewers' experience are often viewed as better fit for the (desirable) jobs and more likely to get offers (Rivera, 2020).

These existing studies of family resources in merit production and merit evaluations successfully unpacked the complexity of meritocracy in contemporary Western societies. However, the West-centric metanarrative implicitly ignores the facts that (1) institutionalized meritocracy is not unique to the West; (2) identity- or caste-based screening of political elites was not the only form of social mobility in pre-modern societies. Instead, meritocracy in various forms has a long history in pre-modern imperial China and has independently evolved into its modern practices (Liu, 2015; So, 2015). Without the Western influence of industrialization and modernization, meritocracy in imperial China has been defining the examination-based elitist governance structure, and the Mandarin-centric (*guanbenwei*, 官本位) value system to facilitate intergenerational mobility. Similar to its Western counterpart, meritocracy in China, even in its most recent form (Liu, 2015), has never been the exclusive factor for social mobility. Indeed, non-merit family resources mattered for merit evaluation procedures. For example, when recruiting officials, an emperor assessed

organizational fit among equally qualified candidates by comprehensively evaluating their family backgrounds, especially their ascribed economic, cultural, and social capitals, to consolidate his power over the elites (Zhou, 2013).

Inspired by existing studies, our investigation of meritocracy in imperial China decouples this concept from its Western context of industrialization and modernization. This empirical setting enriches our understanding of merit and non-merit factors in social mobility in a non-West and pre-modern context. In what follows, we elaborate on how the CSE, as the most effective practice of meritocracy in imperial China, generated and evaluated the merit of political elites.

## THE CIVIL SERVICE EXAMINATIONS IN THE MING DYNASTY

In China's imperial history, various systems for selecting political elites were practiced, from the hereditary laurels system to the appointment system and then to the CSE system. This evolution consolidated the principle of meritocracy and reduced the influence of aristocratic families (Bol, 2003; Hymes, 1987; Tackett, 2020). From 605<sup>2</sup> to 1904, the CSE selected political elites of different family backgrounds based on their performance in open examinations. Over time, passing the CSE became the predominant path to the bureaucracy, the most desirable position and the ultimate testimony of upward social mobility.

Several features of the CSE in the Ming dynasty brought to light the subtle differences between merit, credentials, and organizational fit, as we have briefly discussed above. The connotation of merit was confined to the possession and application of Confucian knowledge, manifested through written essays, and evaluated by emperor-appointed examiners who themselves passed the CSEs some years earlier. Passing the eliminating stage of MEs generated the credential that qualified students for bureaucratic jobs. Then, in the following non-eliminating stage of PEs, non-merit factors were considered to assess students' organizational fit, which favored those from some families while discriminating against others.

### Producing merit for the CSEs

The founding emperor of the Ming dynasty Zhu Yuanzhang (朱元璋, 1328–1398) ordered the establishment of dynasty (public) schools at all levels of administrative units in 1369. Besides basic educational functions, dynasty schools “became simply way-stations for student to prepare on their own for civil service examinations” (Elman, 2000:97). Open competition through examinations determined who could enter these schools. In principle, only students who registered at dynasty schools or two imperial colleges (*guozijian*, 国子监) were eligible to take the CSEs. Figure 1 illustrates the required steps for a typical student to progress in the CSE ladder.

In addition to dynasty schools, mass education at the elementary level was fulfilled and subsidized by communities, lineages, clans, temples, and charity organizations. Children at a young age could enroll in those privately funded schools to prepare for the exams to enter dynasty schools. Private funds also sponsored students' CSE-related travel and lodging expenses. For example, many native-place associations (*huiguan*, 会馆) were founded in Beijing and accommodated students who took MEs and PEs there (Ho, 1966).

In a nutshell, as an important mobility channel, the CSE featured a merit-based screening of political elites, partly releasing some revolt potentials. Unlike contemporaneous Europe, where

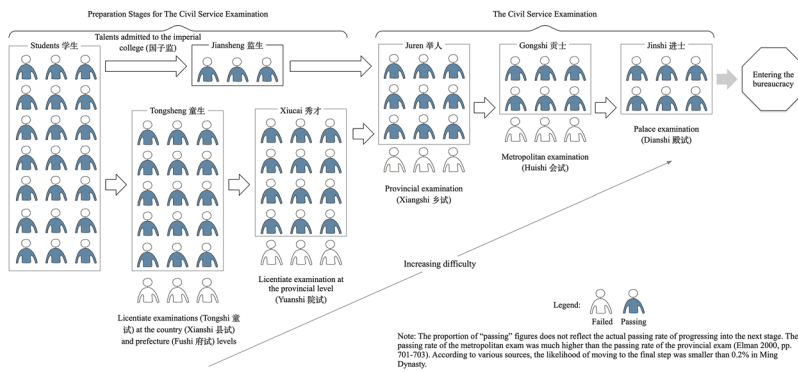


FIGURE 1 Required steps for a typical student to progress in the CSE ladder. [Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

strong social barriers between nobility and commoners were upheld by identity- or caste-based reproduction, the affluent Ming dynasty Chinese could actively pursue power and status by investing in examination (Elman, 1991). Admittedly, innate inequality in terms of generating merit still existed under such institutional arrangements. However, the magnitude of its impacts on merit production was curtailed. It stimulated aspiration and provided opportunities for social members (exclusively for males) to invest in education and examinations.

## Evaluating merit during the CSEs

Transparency and anonymity legitimized the CSE and satisfied people's expectations of fairness. The scope, format, time, and place of the examinations were officially fixed and made open to the public. In terms of scope, all examination questions came from quotations and Zhu Xi's (朱熹, 1130–1200) interpretations of the *Four Books* and *Five Classics* (*sishuwujing*, 四书五经). No points were given to students' personal opinions outside this scope. Regarding format, each examination followed the officially announced question design, including the number of questions, time limits, and the required components of answers. With respect to time and place, each examination was organized according to the officially announced schedule at the designated and strictly surveilled exam site.

The Ming dynasty organized CSEs triennially, with each CSE consisting of three sequential examinations. Provincial Exams (PREs) (*xiangshi*, 乡试) were organized at 14 provincial capitals in August.<sup>3</sup> PREs passed a certain number of students according to the pre-determined quota. When a student passed a PRE, he was assigned a ranking (denoted by PRER) to indicate his relative performance vis-à-vis other passing students of the same PRE (in the same province of the same year).

Passing the PRE qualified a student to take the national level ME the following February<sup>4</sup> in Beijing. Without a pre-determined quota, each ME usually passed approximately 300 students. Many procedures were adopted to ensure MEs were fair and transparent. The MEs were organized in the Examination Hall (*gongyuan*, 贡院). This place was strictly surveilled and a body search prior to entrance was mandatory. Upon entering, no one was allowed to leave until the end of the ME. Once inside, a student was assigned a doorless cell and was constantly monitored by patrolling soldiers and examiners. Each ME implemented a set of strict anonymous procedures.

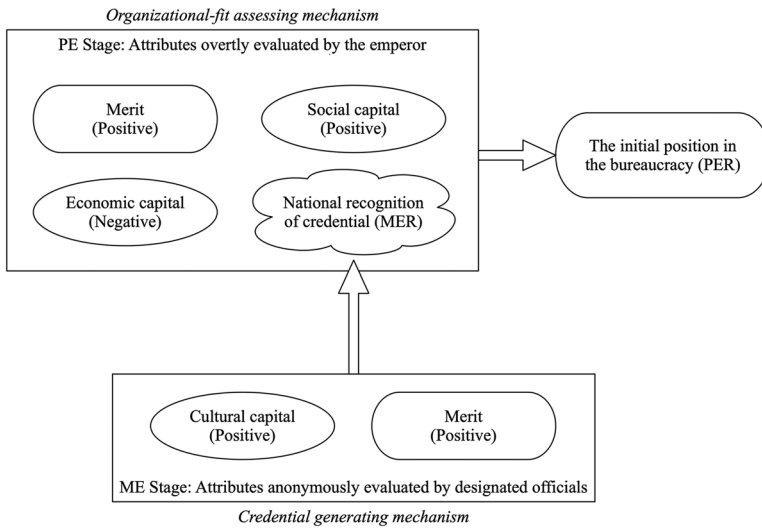


FIGURE 2 The two-stage evaluation framework of credential generating and organizational-fit assessing.

For example, each student was assigned an identification number to conceal his identity. Then, completed essays were transcribed by 200–300 copyists prior to grading to make sure that no examiner could identify a student via handwriting or special symbols (Elman, 2013: 227). After passing the ME, each student received a ranking (denoted by MER).

Those who passed the ME were allowed to take the subsequent PE in March inside the Forbidden City (紫禁城) of Beijing. The candidates sat for the PE for one day on March 15<sup>th</sup>, from dawn to dusk, writing down their answers to a question asked by the emperor. There was no elimination during the PE, which was also not anonymously graded. A group of ad hoc examiners consisting of high-level officials helped the emperor throughout the evaluation process. After collecting the essays, a couple of promising ones—based on ME performance and post-ME socialization in Beijing—were singled out for the examiners to read carefully the next day. Those were later presented to the emperor, who would decide their relative rankings as the top performers. The remaining essays, too, were each read by several examiners to receive a relative ranking (denoted by “PER”). Throughout this tight schedule of evaluation (only one day), family- and hometown-induced favor exchange—likely mobilized while the candidates stayed in Beijing to prepare for the ME and PE—mattered for PE rankings. A higher ranking (i.e., a smaller PER) usually led to an initial job offer of a more promising future.

The reason why the empire state spent considerable resources on such a no-elimination re-evaluation has not received adequate scholarly attention. Historians suggested that the PE provided the emperor with discretion to pass the students he preferred. This is in line with the organizational fit mechanism we have proposed, which in our context enabled an emperor’s political calculations between enlarging a talent pool, patronizing students from a certain background, and promoting an inhabited meritocracy.<sup>5</sup>

We believe that CSEs generated credentials and assessed organizational fit in separate stages. As Figure 2 illustrates, the MEs upheld meritocracy and served as the credential-generating mechanism, in line with the upward mobility argument (Ho, 1964; Kracke, 1947, 1953). The PEs re-evaluated the passing students by considering their family background, fulfilling the organizational fit mechanism.

## DATA AND MEASUREMENTS

The China Biographical Database (CBDB) at Harvard University<sup>6</sup> provides records of 14,116 students who passed 51 CSEs in part of the Ming dynasty. For most students, we know their three examination rankings, personal attributes, and family background. We exclude 1,364 observations of five CSEs due to missing ages and/or exam rankings and additional 325 cases of the remaining 46 CSEs that did not have complete family background information. This leaves us with a sample of 12,427 students who passed 46 CSEs between 1400 and 1580. Several reasons underscore this selection. For one thing, the CSE reached its zenith during the Ming dynasty and thus signaled a more ideal meritocracy. It provides a better opportunity to estimate the upper bound of the effect of meritocracy on intergenerational mobility. For another, the digitalized effort of CSEs is so far the most systematic for the Ming dynasty, adding a set of otherwise unattainable variables to tease out causal mechanisms (e.g., the vital record of a student's parents). Readers should bear in mind these features when linking our findings to CSEs in other dynasties. We adapt and slightly revise Jiang and Kung's (2021) measures of exam performance, merit, and wealth of the Qing dynasty (1644–1912) to meet available data in our setting.

### Examination performance as the dependent variable

For each CSE or exam year  $j$ , we convert the discrete ranks to a 0–100 continuous measure of student  $i$ 's performance. This is because among  $N_j$  students who passed the ME of year  $j$ , the top performer ranked “1” and the last performer ranked “ $N_j$ ”. We cannot use this ME ranking ( $MER_{ij}$ ) directly since the  $N_j$  varied by exam years (e.g., 99 in 1433, and 403 in 1533 and 1568). The following formula generates a continuous measure of a student  $i$ 's ME performance in the exam year  $j$  ( $MEP_{ij}$ ). This measure slightly revises Jiang and Kung's (2021) definition so that the  $MEP_{ij}$  assigns exactly 100 to all top performers and reduces to 0 continuously as performance decreases.

$$MEP_{ij} = (N_j - MER_{ij}) \frac{100}{N_j - 1}$$

Similarly, we convert the original PE ranks ( $PER_{ij}$ ) to a continuous measure of PE performance ( $PEP_{ij}$ ).

$$PEP_{ij} = (N_j - PER_{ij}) \frac{100}{N_j - 1}$$

### Independent variables

#### Merit

Much of the CSE content revolves around rote memorization and mechanical regurgitation of the 400,000 Chinese characters and phrases in the Confucian classics (Elman, 2000), for which older students were presumed to have an advantage over equally intelligent younger peers by virtue of having more time to practice and memorize. In addition, age was also correlated positively with the number of times a student had previously failed the MEs. Therefore, in line with other studies

(Jiang & Kung, 2021; Marsh, 1961), we assume that a student who passed the ME at a younger age would have had to compensate for his lack of accumulated experience with merit superior to those of his older peers. Due to its lack of comparability to the mean merit of a student's cohort, we do not use age directly in regressions. Instead, we define a continuous academic competency ( $AC_{ij}$ ) for student  $i$  in exam year  $j$  to solve this imperfection.

$$AC_{ij} = -\frac{age_i - \overline{age}_j}{S_{age_j}}$$

The mean ( $\overline{age}_j$ ) and standard deviation ( $S_{age_j}$ ) of ages are obtained from  $i$ 's cohort who passed the ME in year  $j$ . A positive  $AC_{ij}$  reflects higher merit compared to the average.  $AC_{ij}$  ranges from  $-4.802$  to  $3.058$  with a mean of 0 and a standard deviation of 1. Table 1 reports summary statistics of relevant variables.

Besides the measure of merit, we control for examination performance of the previous stage in regression models to further capture the unobservable attributes of merit. See more discussion below in Section 5.

## Influential social capital

Social capital has various origins and definitions. We propose a possible synthesis of these definitions: social capital refers to mobilizable productive resources, both tangible and intangible (Lin, 2001a, 2001b), derived from people's embeddedness (Granovetter, 1985) in a macro social structure (Coleman, 1988, 1990), in meso-level organizations (Putnam, 2000), and in micro, concrete (Granovetter, 1973) and durable interpersonal connections (Bourdieu, 1986; Burt, 1992). There are three types of social capital: bonding social capital acts as a reward to homogeneous group members, bridging social capital allows cross-boundary mobilization of heterogeneous resources in different social circles of similar social status, and linking social capital grants access to resources across the social hierarchy (Szreter & Woolcock, 2004).

In survey studies of bonding and bridging social capital, the name generator (McCallister & Fischer, 1978) is a suitable operationalization, because it directly captures the availability and the structural properties of social connections within and between a given network boundary. It is thus more capable of measuring the structure and the strength of one's embeddedness. The position generator (Lin & Dumin, 1986) and the New Year Greeting Networks (Bian & Li, 2000), as the localization of position generator in the Chinese context, are usually used to measure the availability of linking social capital. This approach ignores the overall network structure and the strength of each social tie but focuses heavily on the diversity of available resources. The resource generator (Van der Gaag & Snijders, 2005; Snijders, 1999) is better suited to record how available resources are actually mobilized by a focal respondent.

When analyzing historical archives, the major difficulty of social capital operationalization is the lack of available records. For example, it is usually challenging to identify bonding and bridging social capital via social ties connecting a historical person to his/her network alters. Among empirical studies of the CSE, a common practice of the name generator is to simplify concrete social connections to whether the student and the examiner came from the same hometown (Lin, 2020) or whether the father of a student and the examiner passed the CSE in the same year (Ke et al., 2023). Replacing concrete social ties with spatial and temporal similarities is not a perfect

TABLE 1 Descriptive statistics.

Variable	Mean (S.D.) / %	Variable	%
<b>Examination performance</b>		<b>Control variables</b>	
Palace exam	50.137 (28.841)	Provincial origins	
Metropolitan exam	50.895 (28.558)	<i>Fujian</i>	8.62%
Provincial exam	58.616 (29.902)	<i>Guangdong</i>	3.36%
<b>Merit/Human capital</b>		<i>Guangxi</i>	0.84%
Academic competence	0.000 (0.999)	<i>Henan</i>	6.43%
<b>Cultural capital</b>		<i>Huguang</i>	5.43%
# of brothers being intellectuals	0.172 (0.520)	<i>Jiangxi</i>	9.90%
<b>Economic capital</b>		<i>Shandong</i>	6.85%
# of wife + concubine(s)	1.169 (0.426)	<i>Shanxi</i>	4.47%
<b>Influential social capital (ISC)</b>		<i>Shannxi</i>	4.10%
Father's official ranking (FOR)	2.555 (4.545)	<i>Shuntian</i>	13.81%
Intergenerational influence		<i>Sichuan</i>	6.36%
<i>No ISC</i>	71.03%	<i>Yingtian</i>	15.81%
<i>Rapidly accumulated</i>	5.62%	<i>Yungui</i>	1.37%
<i>Steadily accumulated</i>	11.27%	<i>Zhejiang</i>	12.65%
<i>Hereditarily high</i>	4.28%	Emperors	
<i>Decreasing</i>	7.80%	<i>Jianwen-Yongle-Xuande</i>	2.77%
Father alive when taking ME		<i>Zhengtong-Jingtai-Tianshun<sup>a</sup></i>	13.99%
<i>No</i>	40.81%	<i>Chenghua</i>	16.76%
<i>Yes</i>	59.19%	<i>Hongzhi-Zhengde</i>	19.13%
<b>Control variables</b>		<i>Jiajing</i>	33.66%
Imperial college student		<i>Longqing-Wanli</i>	13.69%
<i>No</i>	40.75%	Exam subjects	
<i>Yes</i>	59.25%	<i>Spring and Autumn (Chunqiu)</i>	8.92%
<i>Huji types</i>		<i>Record of Rites (Liji)</i>	7.67%
<i>Commoner (Min)</i>	61.50%	<i>Classic of Poetry (Shijing)</i>	34.61%
<i>Official (Guan)</i>	4.81%	<i>Classic of History (Shujing)</i>	23.80%
<i>Military (Jun)</i>	28.69%	<i>Classic of Changes (Yijing)</i>	24.99%
<i>Craft (Jiang)</i>	5.00%	<i>N = 12,427</i>	

<sup>a</sup>Reign titles of *Zhengtong* and *Tianshun* belonged to the same emperor Zhu Qizhen (1427-1464).

application of the name generator approach because doing so (1) assumes no difference in the availability and mobility of social resources; and (2) implies the unidirectional flow of favor from the examiner to the student. In addition, the lack of available records makes it less likely to conduct the resource generator to capture what resources were actually mobilized hundreds of years ago by a historical person.

In our study, we confine our discussions to the topic of how students' linking social capital was actively mobilized to achieve advantages in exam evaluation. Thus we modify the position generator to operationalize linking social capital using historical records. Given the Mandarin-centric nature of imperial China, we believe that personally knowing someone in the bureaucracy is a core indicator of linking social capital, which enables a student's family to exert interpersonal

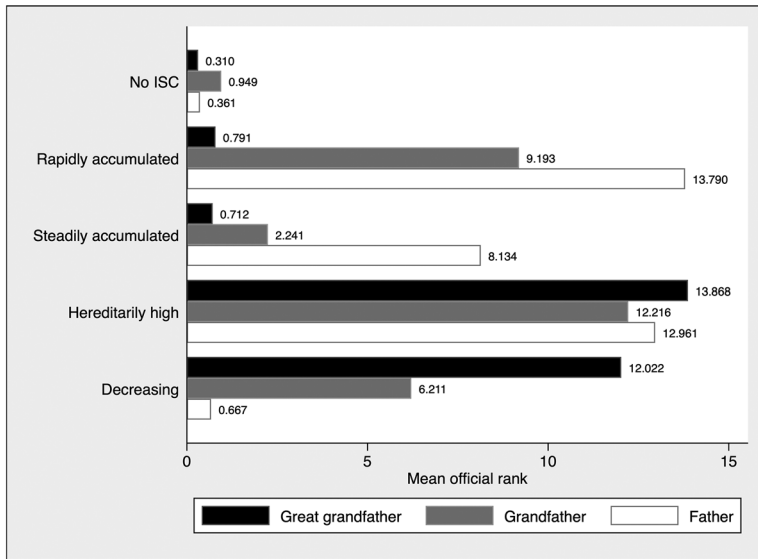


FIGURE 3 Mean official ranks of great-grandfathers, grandfathers, and fathers by latent profiles.

influence in the merit evaluation procedures of CSE. We define social ties reaching officials in the bureaucracy as the influential social capital (ISC). And we believe that the ISC is conceptually comparable to social capital measured by the position generator since the ISC is the contextualized position generator for historical archives. We measure the ISC in two ways. The first is straightforward. For each student, we generate a 0–20 continuous scale of his father’s official ranking (FOR) by coding the original texts of a father’s official titles. The FOR ranges from 0 (not in the bureaucracy) to 20 (holding the highest position).<sup>7</sup> With a mean of 2.555 and a standard deviation of 4.545, the FOR shows that most students came from families without direct access to contacts in the bureaucracy. The second way to measure the ISC allows us to capture the accumulative nature of social capital across generations, which cannot be easily achieved by the common practice of measuring spatial and temporal similarities. Using the coding scheme of FOR, we convert the official titles of a student’s grandfather and great-grandfather into two continuous 0–20 scales: the grandfather’s ranking (GOR) and the great-grandfather’s ranking (GGOR). Then, the Mplus latent profile analysis of FOR, GOR, and GGOR suggests five profiles, as shown in Tables S1 and S2. We use Figure 3 to illustrate basic patterns of FOR, GOR, and GGOR for each latent profile: Profile 1 (71.03 % of valid cases) refers to families with no ISC. Profile 2 (5.62 %) depicts a rapidly accumulated ISC. Profile 3 (11.27 %) demonstrates a steady accumulation of ISC. Profile 4 (4.28 %) illustrates the hereditarily high ISC across generations. Profile 5 (7.80 %) implies the decreasing ISC.

These measurements of ISC also give us an opportunity to separate the availability of social capital from the mobilization of social capital so that this study can address the implicit yet crucial theoretical gap between having social resources and actually employing these resources. To proxy the mobilization of social capital, we generate a dummy variable of whether a student’s father was alive when he passed the ME. As students passed their MEs, 59.19 % of them had fathers alive. We believe that this proxy is culturally reasonable and socially valid. In Chinese *guanxi* culture, mobilizing social resources of family members to facilitate labor market outcomes is common (Bian, 1997; Bian et al., 2014; Bian et al., 2015; Chen & Volker, 2016), which makes it particularly

important if the contact person is alive and calls for favor exchange (Wang, 2013). If the useful contacts are no longer active (e.g., passed away in our setting), then they are less likely to be useful. As a Chinese proverb suggests, the tea cools down as soon as the person is gone (*renzou chaliang*, 人走茶凉).

## Cultural capital

We convert CBDB's original texts to count the number of a student's brothers who ever enrolled in dynasty schools (or imperial colleges) or passed the CSE themselves as a measure of cultural capital.<sup>8</sup> A student with more such brothers tended to have a stronger educational aspiration, more successful role models, and more examination-related tacit skills. This measure ranges from 0 to 7 with a mean of 0.172 and a standard deviation of 0.520.

## Economic capital

Inspired by Jiang and Kung (2021), we count the total number of wives and concubine(s) of a student as a proxy of his economic capital. In the Ming dynasty, polygamy was popular among rich families, given the fact that a man's family must pay a considerable bride price and cover all wedding-related expenditures. This count ranges from 0 to 5 with a mean of 1.169 and a standard deviation of 0.426.

## Control variables

To evaluate the net effects of merit and non-merit factors, we control the following potential influence on exam performance in all regression models.

### Imperial college student

An imperial college student may carry additional advantages of the CSE preparation (*vis-à-vis* those enrolled in dynasty schools) due to better educational resources. We thus introduce a dummy variable to control for this variation (1 for imperial college students and 0 for students enrolled in dynasty schools). In valid cases, 59.25 % were imperial college students.

### Huji types

In regression models, we also control four household registration (*huji*, 户籍) types. Most (61.50 %) students in the analytical sample were from commoner (*min*, 民) families. Around 4.81 % of our analytical sample came from official (*guan*, 官) families, which was much higher than the population baseline.<sup>9</sup> There were 28.69 % and 5 % of students coming from military (*jun*, 军) and craft (*jiang*, 匠) families, respectively. To demonstrate the possible advantages of students from some less typical *huji* types, we use "commoner" as the reference group in regressions.

## Provincial origins

In addition, 14 provincial dummies derived from 14 provincial origins of students reflect the effects of the regional quotas enforced in 1427,<sup>10</sup> which, as a policy intervention, specified quotas for passing students from major regions (Elman, 2013). We use Fujian province as the reference group in regressions.

## Exam subjects

We cannot ignore the difference between students choosing to concentrate on one of the *Five Classics* as the exam subject. Such a choice may reflect unobservable heterogeneity. Among these five subjects, the most popular choice was the *Classic of Poetry* (*Shijing*, 诗经) (34.61 % of students concentrated on this subject), and the least popular one was *Record of Rites* (*Liji*, 礼记) (7.67 %). We use the subject of *Spring and Autumn* (*Chunqiu*, 春秋) as the reference group in regressions, which was believed to have a positive impact on exam performance for students from certain places in the early Ming dynasty (Ding, 2015, 2019, 2020).

## Cubic spline of PRE performance

Besides the aforementioned controls, we believe that a student's PRE performance helps to capture other unobserved variations on his ME performance. The following formula transforms the original PRE ranking<sup>11</sup> of a student  $i$  in a province  $k$  ( $PRER_{ik}$ ) to a 0–100 continuous PRE performance measure ( $PREP_{ik}$ ) so that higher values represent better performance.

$$PREP_{ik} = (N_k - PRER_{ik}) \frac{100}{N_k - 1}$$

We incorporate the possible non-linear effect of  $PREP_{ik}$  on  $MEP_{ij}$  by further converting  $PREP_{ik}$  into three cubic spline variables (Harrell, 2015) of  $PREP_{ikc1}$ ,  $PREP_{ikc2}$ , and  $PREP_{ikc3}$ , which are continuous variables.<sup>12</sup>

## METHODS

Our data had a clear hierarchical structure: we may identify each given student  $i$  belonging to his cohort of the exam year  $j$ , under the emperor reign  $m$ . In the analytical sample, 12,427 students belonged to 46 exam years, which were further nested in six groups of emperor reigns. Such a hierarchical structure made student performance of the same exam year and the exams organized under the same emperor reign not statistically independent. Thus, mixed-effect regression models defined as Equations (1) and (2) are the suitable method to test our hypotheses.

In Equation (1), a three-level random-intercept model regresses ME performance ( $MEP_{ijm}$ ), on independent variables (denoted by the matrix  $\mathbf{I}$ ) of merit, and social, cultural, and economic capitals.  $B_1$  is a vector of slopes. We control the effects of imperial college student status, exam subjects, household registration types, provincial origins, and three cubic spline variables of the

PRE performance. The matrix  $\mathbf{C}$  represents these controls, and  $\mathbf{B}_2$  is a vector of their slopes.<sup>13</sup> We assume the normality of residual  $e_{ijm}$  with a zero mean and a fixed variance ( $\sigma_e^2$ ).

$$\begin{aligned} MEP_{ijm} &= b_{0jm} + \mathbf{I}\mathbf{B}_1 + \mathbf{C}\mathbf{B}_2 + e_{ijm} && \text{Level 1} \\ b_{0jm} &= \gamma_{00m} + u_{0jm} && \text{Level 2} \\ \gamma_{00m} &= \delta_{000} + v_{00m} && \text{Level 3} \end{aligned} \quad (1)$$

At Level-1,  $b_{0jm}$  is the random intercept for student  $i$  in the year  $j$  under the emperor reign  $m$ . We capture the random change of  $b_{0jm}$  at Level-2 by the linear combination of an intercept  $\gamma_{00m}$  and a normally distributed random noise of  $u_{0jm} \sim N(0, \sigma_u^2)$ . We further assume that Level-2 intercept  $\gamma_{00m}$  varies by emperor reigns and randomly deviates from its mean ( $\delta_{000}$ ) with a random noise of  $v_{00m} \sim N(0, \sigma_v^2)$  at Level-3.

Similarly, we define a three-level model for PE performance ( $PEP_{ijm}$ ) in Equation (2). In this model, the matrix  $\mathbf{I}$  refers to measures of three types of capitals, and the matrix  $\mathbf{C}'$  denotes dummy control variables in Equation (1). We do not control the ME performance to avoid possible impacts of “overcontrolling,” such as overfitting the regression models (Achen, 2005) and contaminating causal effects (Grätz, 2022).  $\mathbf{I}\mathbf{B}_3$  and  $\mathbf{C}'\mathbf{B}_4$  are linear combinations of independent and control variables, respectively.<sup>14</sup> Maximum-likelihood estimates are obtained from Stata (version 17.0).

$$\begin{aligned} PEP_{ijm} &= b'_{0jm} + \mathbf{I}\mathbf{B}_3 + \mathbf{C}'\mathbf{B}_4 + e'_{ijm} && \text{Level 1} \\ b'_{0jm} &= \gamma'_{00m} + u'_{0jm} && \text{Level 2} \\ \gamma'_{00m} &= \delta'_{000} + v'_{00m} && \text{Level 3} \end{aligned} \quad (2)$$

## FINDINGS

### ME performance: Merit and cultural capital

Four models in Table 2 consistently show that merit and cultural capital significantly and positively predict ME performance. All other things being equal, students with higher merit scores and those with more well-educated brothers tended to perform better in MEs. In contrast, we see no significant effect of economic capital on the ME performance. Two measures of social capital—its availability and mobilization—are examined too. In Models A1 and A2, social capital availability measured by FOR is not significant. Model A2 does not support the effect of social capital mobilization. We observe the same pattern of insignificant social capital availability and insignificant social capital mobilization in models A3 and A4, where social capital is measured by different types of intergenerational influence. In Model A3, even though there is a significant and positive coefficient (2.265,  $p < 0.05$ ) of rapidly accumulated influence, the insignificant joint  $\chi^2$  test result ( $\chi^2 = 4.84$ ,  $p > 0.05$ ) implies that ISC measured by a block of dummies does not affect the ME performance. Among the control variables, we observe a significant advantage of imperial college students compared to those from dynasty schools. There is also a significant inter-provincial difference in the ME performance. Other control variables show no significant impact on ME performance.<sup>15</sup>

Taken together, ME examiners, under strict anonymous evaluation rules, fairly assessed students' performance by merit. This means that the credential assigned by the MEs was in line with the institutional designs aimed at upholding meritocracy.

TABLE 2 Mixed-effect OLS regressions of the metropolitan exam performance.

	(A1)	(A2)	(A3)	(A4)
<b>Merit/Human capital</b>				
Academic competence	1.896*** (0.269)	1.823*** (0.283)	1.881*** (0.269)	1.803*** (0.283)
<b>Cultural capital</b>				
# of intellectuals in brothers	1.534** (0.498)	1.548** (0.499)	1.496** (0.499)	1.489** (0.499)
<b>Economic capital</b>				
# of wife + concubine(s)	-0.430 (0.599)	-0.419 (0.600)	-0.439 (0.600)	-0.423 (0.600)
<b>Influential social capital</b>				
<b>Availability:</b>				
Father's official ranking	0.088 (0.058)	0.047 (0.087)		
Intergenerational influence				
<i>Rapidly accumulated</i>			2.265* (1.115)	0.327 (1.696)
<i>Steadily accumulated</i>			-0.016 (0.812)	1.540 (1.236)
<i>Hereditarily high</i>			1.198 (1.330)	0.946 (1.973)
<i>Decreasing</i>			0.602 (0.960)	1.165 (1.501)
<i>Joint test of ISC, <math>\chi^2 =</math></i>			4.84	2.03
<b>Mobilizability:</b>				
Father alive when taking ME		0.265 (0.610)		0.622 (0.628)
<b>Interactions: Mobilizability × Availability</b>				
Yes × Father's official ranking		0.072 (0.111)		
Yes × Rapidly accumulated				3.406 (2.218)
Yes × Steadily accumulated				-2.703 (1.623)
Yes × Hereditarily high				0.458 (2.518)
Yes × Decreasing				-0.943 (1.926)
<b>Control variables</b>				
Imperial College Student	3.282*** (0.553)	3.269*** (0.553)	3.274*** (0.553)	3.256*** (0.553)

(Continues)

TABLE 2 (Continued)

	(A1)	(A2)	(A3)	(A4)
Cubic spline of PRE performance	Omitted			
Provincial origins	Omitted			
<i>Huji types</i>				
<i>Official (Guan)</i>	0.706 (1.231)	0.719 (1.231)	0.582 (1.271)	0.614 (1.271)
<i>Military (Jun)</i>	0.644 (0.585)	0.641 (0.585)	0.639 (0.585)	0.623 (0.585)
<i>Craft (Jiang)</i>	2.454* (1.171)	2.463* (1.171)	2.453* (1.171)	2.461* (1.171)
Joint test of <i>Huji types</i> , $\chi^2 =$	5.08	5.11	5.02	5.01
<i>Exam subjects</i>				
<i>Record of Rites (Liji)</i>	-0.612 (1.233)	-0.613 (1.233)	-0.612 (1.233)	-0.596 (1.232)
<i>Classic of Poetry (Shijing)</i>	0.252 (0.946)	0.257 (0.946)	0.284 (0.946)	0.268 (0.946)
<i>Classic of History (Shujing)</i>	1.559 (0.985)	1.564 (0.985)	1.564 (0.984)	1.550 (0.984)
<i>Classic of Changes (Yijing)</i>	-0.845 (0.982)	-0.845 (0.982)	-0.838 (0.982)	-0.861 (0.982)
Constant	50.58*** (1.802)	50.43*** (1.838)	50.57*** (1.804)	50.26*** (1.842)

Note: Standard errors in parentheses;  $N = 12,427$ .

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ .

Estimates of omitted variables of provincial origins and cubic spline of PRE performance are available upon request. Emperor and exam year are used to define the nested structure of observations for these mixed-effect regression models.

## PE performance: Merit, economic capital, and social capital

Identical to what we observe in ME models in Table 2, four models in Table 3 consistently demonstrate significant and positive merit ( $p < 0.001$ ) and cultural capital ( $p < 0.05$ ) effects on PE performance. Unlike ME models, economic capital significantly ( $p < 0.05$  or  $p < 0.01$ ) and negatively predicts the PE performance. All else being equal, PEs tended to assign higher assessments of organizational fit to students from less affluent families.

Contrary to the MEs, models in Table 3 illustrate an interesting pattern of social capital availability and mobilization effects on PE performance. In Model B1, social capital availability measured by FOR significantly and positively (0.494,  $p < 0.001$ ) predicts PE performance. This effect appears again in Model B2 (0.464,  $p < 0.001$ ). However, Model B2 fails to support a significant social capital mobilization effect, because it shows insignificant interaction between FOR and mobilization. Measured by intergenerational influence, social capital availability in Model B3 exhibits significant and positive effects. Compared to the reference group of no intergenerational influence, students from families with rapidly accumulated (4.404,  $p < 0.001$ ), steadily accumulated (3.466,  $p < 0.001$ ), and hereditary (8.475,  $p < 0.001$ ) intergenerational influence tended to achieve higher PE performance. Particularly, students from families of hereditary

TABLE 3 Mixed-effect OLS regressions of the palace exam performance.

	(B1)	(B2)	(B3)	(B4)
<b>Merit/Human capital</b>				
Academic competence	1.828*** (0.271)	1.690*** (0.284)	1.845*** (0.271)	1.707*** (0.284)
<b>Cultural capital</b>				
# of intellectuals in brothers	1.046* (0.499)	1.077* (0.499)	1.139* (0.500)	1.178* (0.500)
<b>Economic capital</b>				
# of wife + concubine(s)	-1.541* (0.604)	-1.517* (0.604)	-1.572** (0.604)	-1.518* (0.604)
<b>Influential social capital</b>				
<b>Availability:</b>				
Father's official ranking	0.494*** (0.059)	0.464*** (0.088)		
Intergenerational influence				
<i>Rapidly accumulated</i>			4.404*** (1.127)	1.566 (1.715)
<i>Steadily accumulated</i>			3.466*** (0.820)	5.075*** (1.250)
<i>Hereditarily high</i>			8.475*** (1.344)	8.740*** (1.994)
<i>Decreasing</i>			0.570 (0.970)	-1.093 (1.518)
Joint test of ISC, $\chi^2 =$			61.26***	35.08***
<b>Mobilizability:</b>				
Father alive when taking ME		0.718 (0.616)		0.672 (0.635)
<b>Interactions: Mobilizability × Availability</b>				
Yes × Father's official ranking		0.057 (0.113)		
Yes × Rapidly accumulated				4.969* (2.244)
Yes × Steadily accumulated				-2.803 (1.642)
Yes × Hereditarily high				-0.455 (2.548)
Yes × Decreasing				2.787 (1.949)
<b>Control variables</b>				
Imperial College Student	2.190*** (0.548)	2.164*** (0.548)	2.230*** (0.548)	2.191*** (0.548)

(Continues)

TABLE 3 (Continued)

	(B1)	(B2)	(B3)	(B4)
Provincial origins	Omitted			
<i>Huji</i> types				
<i>Official (Guan)</i>	1.079 (1.245)	1.094 (1.245)	0.642 (1.285)	0.678 (1.286)
<i>Military (Jun)</i>	0.653 (0.591)	0.640 (0.591)	0.671 (0.591)	0.645 (0.591)
<i>Craft (Jiang)</i>	1.218 (1.184)	1.221 (1.184)	1.224 (1.185)	1.233 (1.184)
Exam subjects				
<i>Record of Rites (Liji)</i>	-0.967 (1.247)	-0.974 (1.247)	-1.001 (1.247)	-0.972 (1.247)
<i>Classic of Poetry (Shijing)</i>	-0.483 (0.952)	-0.475 (0.952)	-0.518 (0.953)	-0.498 (0.953)
<i>Classic of History (Shujing)</i>	1.302 (0.995)	1.304 (0.995)	1.244 (0.995)	1.225 (0.995)
<i>Classic of Changes (Yijing)</i>	-0.503 (0.988)	-0.504 (0.988)	-0.554 (0.989)	-0.566 (0.988)
Constant	53.52*** (1.400)	53.09*** (1.448)	53.68*** (1.403)	53.26*** (1.452)

Note: Standard errors in parentheses;  $N = 12,427$ .

\*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ .

Estimates of the omitted provincial origins are available upon request. Emperor and exam year are used to define the nested structure of observations for these mixed-effect regression models.

intergenerational influence outperformed all others. It is likely a reward for long-term loyalty to the imperial court. Students from families with decreasing intergenerational influence and students from families without influence had to face the same disadvantage of social capital insufficiency ( $0.570$ ,  $p > 0.05$ ). The  $\chi^2$  test confirms ( $\chi^2 = 61.26$ ,  $p < 0.001$ ) that ISC as a block of dummies jointly predicts the PE performance.

Model B4 confirms the same advantage of students from families of steadily accumulated ( $5.075$ ,  $p < 0.001$ ) and hereditary ( $8.740$ ,  $p < 0.001$ ) intergenerational influence as well as the same disadvantage of the lack of social capital. Model B4 also shows that all other things being equal, students from families of hereditary influence for generations outperformed others. At the same time, the  $\chi^2$  test confirms ( $\chi^2 = 35.08$ ,  $p < 0.001$ ) that ISC as a block of dummies jointly predicts the PE performance.

Model B4 shows insignificant main effects of rapidly accumulated intergenerational influence ( $1.566$ ,  $p > 0.05$ ) and social capital mobilization ( $0.672$ ,  $p > 0.05$ ). However, there is a significant and positive interaction ( $4.969$ ,  $p < 0.05$ ) between these two main effects. This interesting finding implies that students from families with rapidly accumulated influence were favored only when their living fathers actively mobilized such influence. This interaction also captures the emperor's favor exchange with the newly emerged political elites.

Among the control variables, we see a significant advantage of imperial college students and a significant inter-provincial difference in PE performance. Other controls are insignificant.

**TABLE 4** Contrasting patterns revealed in models of Metropolitan exam performance and Palace exam performance.

Model	Merit/Human capital	Cultural capital	Economic capital	Influential social capital (ISC)			
				Father's	Father's × Mob.	Inter-generational	Inter-generational × Mob.
ME	+	+	No	No	No	No	No
PE	+	+	-	+	No	+	+

“+” means that a factor positively determines performance.

“-” means that a factor negatively affects performance.

“No” means that a factor does not relate to the performance.

Taken together, models in Table 3 remind us that ISC measured by intergenerational accumulation of influence better captures the availability of social capital. It is a better predictor of the organizational fit assessment than the one-generation measure of FOR.

## CONCLUSION AND LIMITATIONS

Using the detailed historical archives, our study demonstrates a two-stage evaluation framework of the CSE, summarized in Table 4. The pattern in the first row of Table 4 leads to a conclusion that the MEs underscored the credential-generating mechanism, similar to the “credential society” argument advanced by Collins (1979).

Given the adoption of strict anonymous evaluation procedures, the MEs assigned the nationally recognized credential largely based on merit. This stage made the CSE an effective means to staff the bureaucracy with talent. It also generated a consensus of social mobility into the ruling class via meritocracy, which contributed to the long-term social stability of imperial China. Besides merit, we find that cultural capital, proxied by the number of brothers in dynasty schools or imperial colleges, also mattered positively for ME performance. It is likely that those intellectual brothers set up a role model of honoring family reputation and following the ancestors-defined success path. Such a positive peer effect heightened a student’s motivation and equipped him with precious tacit knowledge about the CSE. Economic and influential social capitals played no significant roles in this credential-generating stage, which made the meritocratic nature of ME even more convincing.

The pattern shown by the second row of Table 4 leads to another conclusion that the non-eliminating PEs revolved around assessing organizational fit by jointly assessing merit and non-merit factors. Like MEs, PEs favored students with stronger merit and richer cultural capital. But unlike MEs, PEs were much less meritocratic. Without anonymous evaluation procedures at this stage, the emperor and his appointed examiners took non-merit family backgrounds into consideration. In so doing, this deliberate practice of PEs provided the emperor with a counterbalance over economic elites. The negative effect of economic capital on PE performance suggests that students from poorer families were indeed favored, which is consistent with a previous study (Zhao, 2015: 15–16). At the same time, social capital availability and mobilization played a significant and positive role in the PE performance, which resembled an active mobilization of intergenerational influence and an institutionalized reward to the incumbent elites.

In summary, after the MEs selected a group of talented students largely on their merit, the PEs assigned a higher organizational fit assessment to those from socially influential yet economically

vulnerable families. Since non-merit factors directly and substantially interfered with assessing students in the PE stage, the CSE system cannot be simply conceptualized as meritocratic. Instead, it became inhabited by its constituents and achieved an equilibrium that the emperor, incumbent elites, and students were all content with.

The fact that the CSE functioned as an inhabited meritocratic institution in imperial China provides insights into meritocracy in general. Although it is a universal pursuit, what constitutes merit is contextual and controversial in different societies and at different times. For example, in charting higher education and meritocracy in the contemporary US, Karabel (2005: 2) summarizes that the Big Three (Harvard, Yale, and Princeton) introduced a broader redefinition of “merit” in the 1920s, changing their admission policies from a focus on objective academic criteria to an emphasis on subjective non-academic criteria, such as “manliness,” “personality,” and “leadership” (see also Khan, 2011). In our research, we do not make any normative arguments about merit per se; rather, we build on the historical details (e.g., merit was narrowly construed as tested ability in mastering Confucianism through open examination) and explore *how* meritocratic the CSE was in actuality and *under what circumstances* it failed to be meritocratic.

In light of the evolution of merit in CSE with a history of some 1300 years as well as the recent change in race-based affirmative action in the US, we call for more research on the process of developing what merit should be and how coordinated institutions should be designed to uphold meritocracy. Although meritocracy does not always live up to its stated aims in practice, it could still be fulfilled to some extent. The promise of a fulfillable meritocracy constitutes the backbone of an open and just society.

Before discussing limitations, we want to highlight the methodological contribution of modifying the position generator to measure the ISC. Given the challenge of incomplete historical archives, applying the commonly used name, position, and resource generators becomes infeasible. In this study, we demonstrate how to adapt the position generator to the context of historical archives by capturing the availability and accumulation of social ties to persons in the bureaucracy. This methodological innovation provides us with an alternative operationalization of social capital to existing CSE studies. More importantly, this innovation makes our measures of social capital and test of its effect more comparable to existing survey studies. Finally, our measures of ISC, like the New Year Greeting Networks (Bian & Li, 2000), illustrate the flexibility of the position generator: it can be and should be contextualized and localized to capture the essence of mobilizable resources derived from embeddedness.

## Limitations and future research

Data limitations and theoretical gaps outside the scope of this study need to be addressed by future research. First, the CBDB database contains only information on students who passed the CSEs. The empirical results based on their information offered us an incomplete picture of this elite selection institution. Given the increasing efforts of digitizing historical materials, some anecdotal records regarding the PREs in a certain province in particular years may be unearthed and used for further analysis of the stepwise selections at the provincial level. Second, further information is needed to specify the effect of cultural capital. As we have demonstrated a positive and significant effect of cultural capital, our research tackles its complexity captured by the total number of brothers formally educated in dynasty schools or two imperial colleges. Admittedly, this measure allows various possible explanations of its precise mechanisms. We suggest that future qualitative investigations of the genealogies of CSE students focus on concrete content, social meanings, and

consequences of sibling influence among them. Third, limited by available information, we treat the number of wife and concubine(s) as a measure of wealth. This measure is by no means an ideal proxy of wealth. But we have no better options due to the lack of other useful direct measures such as land areas or tax. To the best of our knowledge, individual- or household-level information as such is not available. Yet, anecdotal evidence suggests that some areas, especially the affluent Yangtze River area, may have reserved relevant records. Future studies may tap into relevant opportunities to further illustrate whether and to what extent rich families were discriminated against.

Finally, a comprehensive evaluation of PEs favoring those rich in social capital and discriminating against those with economic capital embodied a long-standing political logic throughout the Chinese civilization.<sup>16</sup> In imperial China, wealth might influence individual officials, but it never dominated the policy-making process. A changing landscape in today's global economy may introduce alternative sources or mechanisms for economic capital to interplay with politics in China. We call for future studies to explore emerging phenomena in related areas, such as the foundations established by private firms and entrepreneurs, which may serve as a vehicle for voicing the opinions of the affluent.

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## ENDNOTES

<sup>1</sup>In this study, we are particularly interested in the upward mobility, and we use the term of “intergenerational mobility” or “mobility” to exclusively refer to the improvement of social status across generations.

<sup>2</sup>It is not crystal clear when the first CSE was held, but many use the year 605 as a starting point.

<sup>3</sup>There was a total of 15 provinces. However, two provinces (Yunnan and Guizhou) jointly organized PREs for many years of the Ming dynasty. We thus use their combined information throughout this article.

<sup>4</sup>In this study, we use dates in the Chinese calendar.

<sup>5</sup>It is said that the first PE was organized by the only empress in imperial China, Wu Zetian (624–705, 武则天). She married an emperor of the Tang dynasty (618–907) and later crowned herself as the founding empress of the Zhou dynasty (690–705) upon the death of her husband. Faced with strong opposition from aristocratic families, in 690, she started to interview and screen the passing students to make sure that she selected those who were less connected to the incumbent elites. Since then, PEs were practiced occasionally and had become an institutionalized component of the CSE since the Song dynasty (960–1279). Its founding emperor Zhao Kuangyin rose to power via military power and was eager to cultivate a group of loyal bureaucrats to constrain the military generals. In the early Song dynasty, PEs were eliminating (Fu et al., 2005). And those who failed PEs several times felt that their opportunity to be political elites were deprived. Such frustration encouraged some to join competing forces

of the Song dynasty (e.g., the Western Xia dynasty). To prevent the loss of talents, the emperor Song Renzong (r. 1022-1063) initiated the non-eliminating tradition of PE in 1057 (Chen 2015 [1658]). The Ming and Qing dynasties followed this practice.

<sup>6</sup> <https://projects.iq.harvard.edu/cbdb> (accessed on July 7, 2023).

<sup>7</sup> The Ming dynasty bureaucracy has nine ranks, with each rank having two subcategories (e.g., rank one and deputy rank one). This gives us 18 groups. In addition, some people worked for bureaucracy but were not included in the nine-rank system. Still, a considerable percentage of the students did not have a father serving in the bureaucracy at all. This generates a total of 20 scenarios. We reverse-code the ranks, in which rank one receives a score of 20, while those never in the bureaucracy are assigned a score of 0.

<sup>8</sup> Some brothers could be by different mothers, as a student's father may have a wife and several concubines. The original historical archives, however, did not make that distinction. The CBDE data does not include cousins from an extended family.

<sup>9</sup> According to Li (2008), there were 24,683 official positions in the Ming dynasty. If we use 60 million as the male population benchmark, it means that officials accounted for roughly 0.04 % of the Ming's total population.

<sup>10</sup> Names and coarse geographical borders of these provinces are like today's situation, except for Yungui, that is a combination of today's Yunnan and Guizhou provinces. Shuntian roughly covers modern Hebei province, Beijing, and Tianjin. Yingtian includes contemporary Shanghai, Jiangsu Province, and Anhui Province, and Huguang is equivalent to contemporary Hubei and Hunan provinces. To be sure, regional quotas were reserved for three broader regions rather than for provinces. Yet, exactly how geographic information was marked on transcribed exam essays during the ME evaluation was not clear. It is likely that provincial origin was highlighted. In case regional origin was marked, other information, such as the specific choice of *Five Classics*, could be combined for an examiner to make an educated guess of which province a student came from. We omit estimates of provincial origins from Tables 2 and 3 to save space. These estimates are available upon request.

<sup>11</sup> A caveat of this control variable is that after passing the PRE, a student can repeatedly take the MEs triennially without taking the PRE all over again. In the CBDB, we cannot identify in what year a student passed his PRE. Nevertheless, we believe that the benefits of controlling PRE performance exceed its imperfection.

<sup>12</sup> We omit estimates of three cubic spline variables from Table 2 to save space. These estimates are available upon request.

<sup>13</sup> The control variables of provincial origins and cubic splines of PRE performance are not included in the regression results in Table 2 to save space. Full regression models are available upon request.

<sup>14</sup> Due to the same reason, control variables of provincial origins are not included in the regression results in Table 3. Full regression models are available upon request.

<sup>15</sup> Although we see significant and positive coefficients of craft (*jiang*) in these models, the insignificant joint  $\chi^2$  test results consistently show that *Huji* types measured by a block of dummies do not affect ME performance.

<sup>16</sup> See the quotation "Thus in the highest antiquity, people loved their relatives and were fond of what was their own; in middle antiquity, they honoured talent and talked of moral virtue; and in later days, they prized honour and respected office." in the "Opening and Debarring" of *The Book of Lord Shang*, <https://ctext.org/shang-jun-shu/opening-and-debarring> (accessed on July 7, 2023).

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