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Reciprocal Effects of Parental Meritocratic Beliefs and Children's Educational Performance in China: A Dual-Process of Meritocracy?

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Abstract:	Different research traditions have long held that parental beliefs motivate children's educational achievement. However, regarding meritocratic beliefs, sociologists often argue that meritocratic narratives legitimize and make sense of societal inequalities as justly deserved. Using the case of China, I simultaneously tested these two competing hypotheses of the relationship between parental perception of meritocracy and children's educational achievement. Parental beliefs about skills and hard work as predictors of higher grades were identified. I analyzed data from the first and second waves of the China Educational Panel Survey. Autoregressive cross-lagged structural models indicated that parental meritocratic beliefs do not affect children's educational performance but, rather, meritocratic beliefs are affected by academic results, suggesting their justificatory role. This pattern is much sharper in rural China, where traditional Chinese culture is preserved. The implications of meritocratic beliefs for a broader discussion of citizens' beliefs about social inequalities and stratification are discussed.
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Dear editor,

I am writing to submit my manuscript entitled **"Reciprocal Effects of Parental Meritocratic Beliefs and Children's Educational Performance in China: A Dual-Process of Meritocracy?"** to Social Science Research. I firmly believe that your journal is a suitable outlet for publishing this article. The aim of the present study is to test the legitimation and motivational hypotheses of meritocratic beliefs in the Chinese educational system: How are parents' meritocratic beliefs and children's educational performance affected by each other? It is an important contribution to the cultural explanation of educational inequalities and moves forward the growing literature in meritocratic beliefs.

The use of longitudinal data, the application of autoregressive cross-lagged models, and several robustness checks make this article of interest to the audience of Social Science Research. In addition, the study discusses the literature in educational inequalities, stratification beliefs, and sociology of culture. Therefore, it engages with the broad audience of SSR in multiple directions.

As an ethical disclosure, a previous version of this paper was submitted to Sociology of Education. Although two positive reviews and one more critical, the editor suggested submitting the article to another outlet. Their comments were incorporated, and the overall quality of the paper has improved. In addition, I declare no affiliation with or involvement in any organization or entity with any financial interest, or non-financial interest in the subject matter o material discussed in this manuscript.

Thank you very much for your consideration.

Sincerely,

Francisco Olivos

Reciprocal Effects of Parental Meritocratic Beliefs and Children's Educational Performance in China: A Dual-Process of Meritocracy?

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Abstract

Different research traditions have long held that parental beliefs motivate children's educational achievement. However, regarding meritocratic beliefs, sociologists often argue that meritocratic narratives legitimize and make sense of societal inequalities as justly deserved. Using the case of China, I simultaneously tested these two competing hypotheses of the relationship between parental perception of meritocracy and children's educational achievement. Parental beliefs about skills and hard work as predictors of higher grades were identified. I analyzed data from the first and second waves of the China Educational Panel Survey. Autoregressive cross-lagged structural models indicated that parental meritocratic beliefs do not affect children's educational performance but, rather, meritocratic beliefs are affected by academic results, suggesting their justificatory role. This pattern is much sharper in rural China, where traditional Chinese culture is preserved. The implications of meritocratic beliefs for a broader discussion of citizens' beliefs about social inequalities and stratification are discussed.

Key words: meritocratic beliefs, China, educational achievement, legitimation.

Introduction

Meritocratic narratives, such as the American Dream, are losing effectiveness as collective myths (Lamont 2019). In modern societies, meritocracy is a guiding principle for reward allocation based on achievement rather than ascription (Mijs 2016b; Tsay et al. 2003; Young 1958). Defenders of meritocratic ideals (Herrnstein and Murray 1996; Saunders 1995) indicate that it serves two purposes: first, it enables scarce resources to be efficiently allocated and, second, it incentivizes effort. However, unequal and underserved starting positions lead to the understanding that meritocracy violates its own merit principle. It legitimizes societal inequalities as justly deserved, and misfortune becomes a personal failure (Mijs 2016b). However, the cross-national and comparative efforts of legitimization

researchers have not produced longitudinal evidence to rule out bidirectional effects (Mijs 2016a, 2019). Either way, these competing perspectives could apply to different experiences of social mobility, professional career, educational achievement or any sort of success. Given this context, the aim of the present study is to test these two perspectives simultaneously in the case of the Chinese educational system: How are parents' meritocratic beliefs and children's educational performance affected by each other? By understanding the role of parental meritocratic beliefs in the educational system, I examine how meritocratic beliefs shape and are shaped by success in society. This is not an attempt to set aside the relevance of meritocratic beliefs in China but to better understand their relationships with children's educational performance. In addition, I examine how this dynamic varies between rural and urban China as an important cultural cleavage.

This question arises from the classic debate in the sociology of culture on the relationship between culture and action (Frye 2012; Lizardo et al. 2016; Schwarz 2018; Vaisey 2009). However, as Vaisey and Valentino (2018) argue, beliefs are typically sidelined by cultural sociologists. Therefore, parental beliefs about meritocracy are narratives of how rewards are allocated in the educational system. Hence, by discussing the reciprocal effects of parental beliefs and educational outcomes, I engage in a broader discussion about culture and action literature. Moreover, parental meritocratic beliefs could be considered cultural orientations of parenting (Weininger, Lareau, and Conley 2015), being consequential for inequality and social reproduction.

This article makes several contributions to the literature. First, I simultaneously test two competing hypotheses about the role of parental meritocratic beliefs in the educational system, using a theoretical rationale and rich longitudinal data. Sociologists tend to propose that meritocratic narratives legitimize inequalities (e.g. Lamont 2019; Mijs 2019), distancing themselves from motivational arguments. However, this theory has not been accurately tested. In the present study, autoregressive cross-lagged structural models are implemented using data from the two waves of the China Educational Panel Survey with the aim of disentangling the theorized reciprocal effects. This

theoretical argument and research design could be applied in different societies and to understand the role of meritocratic beliefs in a myriad of fields.

Second, the Chinese case is a unique setting for studying meritocratic beliefs. Paradoxically, there is no equivalent of the word meritocracy in Chinese. It is often translated as elitism (英才教育), which ignores its antecedents. However, Chinese culture has longstanding meritocratic norms, grounded in mainstream Chinese philosophies. First, it links educational institutions and exam-based qualifications for highly-valued civil service jobs (Hannum et al. 2019). The selection of public servants based on both moral character and talent has been attributed to the earliest period of Chinese history (Xiao and Li 2013). Second, administrative performance provides the basis of merit-based inequality (Xie 2016). It is widely considered the ruling class deserve their benefits as they work for the public good.

In addition, a recent study has shown that individuals from Western countries with higher levels of inequality tend to explain success in meritocratic terms (Mijs 2019). A similar conclusion has been drawn for Latin American countries (Bucca 2016), and experimental evidence in the United States (Molina, Bucca, and Macy 2019). In the case of China, a high level of inequality (Xie and Zhou 2014) and social fluidity (Zhou and Xie 2019), by international standards, bring the justificatory role of meritocratic narratives, alongside their hypothesized motivational effect, into sharper relief. I incorporate the Chinese case in the literature of meritocratic beliefs through a focus on the educational system. As shown in Figure 1, of the countries included in the 2009 International Social Survey Project, China is ranked second in tolerance of inequality in the educational system (3.68). Indeed, the difference between the Philippines, the most tolerant country in the sample, and China is not statistically significant.

[Figure 1]

By meritocratic beliefs, I refer to the perception of reward distribution in the educational system (as it is) in contrast to individual preferences for inequality (what ought to be), which is an important distinction made by previous studies in social justice beliefs (e.g. Castillo 2011). Although meritocratic ideals are important normative principles in Chinese tradition, it is not clear whether Chinese parents perceive educational systems as such, and whether these beliefs have cultural efficacy in the explanation of children's performance. Throughout this article, I will use, for the sake of simplicity, meritocratic beliefs and perceived meritocracy as synonyms.

Finally, this study contributes to the literature by clarifying the debate about the cultural explanation of educational inequality. Values and beliefs are common explanations of racial gaps in the United States. Asian Americans outperform white Americans due to their cultural differences regarding the association between effort and success (Chen and Stevenson 1995; Hsin and Xie 2014; Liu and Xie 2016). Thus, parental beliefs have an effect on children's performance. However, Lee and Zhou (2015) have expressed their concerns about the misperception of culture and Asian American achievement. They are skeptical about findings showing that Confucian values of hard-working have explained Asian American's academic achievement because some migrant groups, such as Chinese and Koreans, are hyper-selected. Asian American children begin their studies from more advantaged positions than other groups, and the host society attributes their academic success to their culture. Thus, Asian American students benefit from positive racial stereotypes at school. The findings reported in this study are particularly insightful for reevaluating the cultural explanation under different social contexts and without the self-selection by cultural repertoire.

This article is structured as follows. First, in the theoretical framework, I contrast motivational and legitimization hypotheses to discuss how different traditions understand the role of meritocratic beliefs. This theoretical puzzle is integrated in a dual process of meritocratic beliefs following a mainstream framework in the sociology of culture. Second, based on this theoretical reasoning, the analytic strategy is proposed. Data and variables are presented in the third section,

which is followed by the results reported in the fourth section. The analyses focus on two aspects. On one hand, I provide descriptive findings of meritocratic beliefs as a starting point to understand the phenomenon in China. On the other, the hypotheses of the interrelation of perceptual beliefs of meritocracy and educational performance are tested. Finally, the conclusion discusses these results in relation to the theoretical reasoning of the first sections and the implications of meritocratic beliefs for a broader discussion of citizens' beliefs about social inequalities and stratification.

Theoretical framework

Meritocratic beliefs as motivation

Parental beliefs exert a large influence on children's beliefs, attitudes, and behaviors. As Frye argues: "*familiar slogan can enter into cultural models and shape individual cognition*" (Frye 2012:1592). Theories in sociology and social psychology posit that parents' perceptions about meritocratic assessments and rewards may promote motivation and effort. As I will show in this section, several studies have suggested that meritocratic beliefs drive academic behaviors and outcomes.

Studies in stratification and the sociology of education have incorporated culture into the explanation of inequalities in educational outcomes. Scholars use a motivational argument to explain the superiority of Asian Americans and the lower performance of black students in comparison to white youth in the United States. Asian Americans perform better because of cultural beliefs that promote a strong connection between hard work and achievement (Chen and Stevenson 1995; Hsin and Xie 2014; Liu and Xie 2016). Most of these studies consider the perception of how rewards are allocated in the educational system. Parental beliefs of this sort set high educational expectations for their children and enhance educational achievement. Similarly, Oppositional Culture Theory (Ogbu 2003) explains the underperformance of Black Americans as a strategy to avoid being labeled as "acting white". Through this adaptive cultural response, black youth alienate themselves from dominant institutions and impair their educational performance. Harris (2008) proposed that these

beliefs link structural conditions to individuals' school behavior. Beliefs operate as antecedents of students' actions. Indeed, one of the four items measuring perceived value of schooling is a straightforward measure of a perceived meritocratic system: "*achievement and effort in school lead to job success later on*" (Harris 2008:616). His findings indicate that the value of schooling, which includes perceptions of meritocracy, predicts achievement and college enrollment of students. Thus, the perception of the educational system as meritocratic is a mechanism through which structural opportunities influence students' behaviors.

Different theories in social psychology support the effect of meritocratic beliefs on educational outcomes. Bandura's Self-Efficacy Theory (Bandura 1997) proposes that efficacy beliefs influence individuals' level of effort, persistence, and choice of activities. Although such beliefs are not narratives, they are frames about student behavior and the theory posits the perceived payoffs of abilities and effort in direct relation with students' own potential. Among the resources of influence on self-efficacy beliefs, parents are prominent. First, by acting as a social model, they provide vicarious experiences. Parents' success fosters one's own beliefs about capabilities to succeed. Second, social persuasion affects self-efficacy beliefs through reaffirmation of capabilities in mastering certain activities. Verbally persuasion leads children to mobilize and sustain greater effort. Therefore, it is plausible to think that parental meritocratic beliefs may influence children's educational outcomes.

In addition, meritocratic beliefs are causal attributions without a specific subject. They refer to how society allocates rewards. Thus, the cultural orientation provided by the perceived meritocracy of the educational system is related to Weiner's (1989) classic attributional model of achievement motivation, one of the most influential theories of achievement-related behavior (Glasgow et al. 1997). In this model, causal attributions – the belief that X affects Y - generate affective reactions and expectations for future educational success, guiding academic behaviors and activities. Indeed, causal beliefs about effort and ability are held to produce the most optimal responses. Both beliefs are

internal to students (locus) and, in the case of effort, it is volitional (controllability) and can change over time (instability). Internal, controllable and changeable causes have been found to affect educational performance (Van Overwalle and De Metsenaere 1990; Perry et al. 2010). Overall, theories in social psychology and the role of culture on ethno-racial disparities suggest that parental meritocratic beliefs may enhance children's educational performance either directly or indirectly through effort.

Meritocratic beliefs as justification

Researchers in sociology often turn the motivational hypothesis upside down. They argue that individual status positively predicts the perception of society as meritocratic because individuals seek to legitimize their superiority through a narrative of success (see Bucca 2016). Moreover, high-status individuals (high-income and those who enjoy high subjective status) reject beliefs that challenge their social position (Kreidl 2000). Thus, instead of endorsing structural explanations of social stratification, they endorse individual explanations, such as skills and abilities. Since parents with high-performing children may be understood as winners in educational systems, the theories of social status literature may be applied to educational performance.

In the legitimation hypothesis, the study of elites debates the role of meritocratic beliefs in justifying educational choices. Khan (2011) provides a detailed account of how meritocratic beliefs work in obscuring social advantages. Through an ethnographic study at St. Paul's School, one of the most prestigious elite boarding high schools in the United States, the author shows how beliefs about hard work and belonging to institutions are used by parents, students, faculty members, and staff to justify privilege. Students interpret their progress based on ideas of merit and work, and not in terms of the natural progress of every student at St. Paul's School. However, as Khan (2011) acknowledges, all students do so, and very few fail to complete their schooling or drop out. This draws an important conclusion in the study of inequality. It is seen as "fair" because privilege or a certain structural position are believed to be products of effort or capabilities. Therefore, inequalities are justified,

maintained and obscured. In this case, the perception of the educational system as meritocratic is a post hoc rationalization of action and objective conditions.

Beyond the particularism of ethnographic approaches in the sociology of elites and the exceptional case of St. Paul's School, the literature suggests the plausibility of legitimation of action and educational outcomes by meritocratic beliefs. Moreover, sociology has strived to generalize the role of meritocratic beliefs as legitimizing inequalities. Based on the theory on the heterogeneity and homogeneity of social structure, and using data from the Program for International Student Assessment (PISA), Mijs (2016a) showed that ability tracking shapes attributions of failure. Students in more homogeneous groups (mixed-ability classes) are more likely to attribute their failure to meritocratic factors, such as (lack of) hard work and academic (in)ability. Thus, stratification provides a context for cognitive processes that legitimize educational inequality. Students interpret their scholastic failure based on their position in the educational stratification. The same role has been suggested for meritocratic beliefs legitimizing inequality at country level (Bucca 2016; Mijs 2019).

A large body of experimental evidence in economics, psychology, and sociology has supported the self-serving bias as an explanation of the effect of performance on normative beliefs (Greenberg, Pyszczynski, and Solomon 1982; Rodriguez-Lara and Moreno-Garrido 2012; Ubeda 2014). In this kind of psychological bias, winners overstate the role of talent, while losers attribute the outcome to external factors rather than meritocratic causes. In a recent experimental study, Molina, Bucca, and Macy (2019) showed the effect of unequal outcomes on cognitive, normative, and affective responses. Their findings indicated that winners are more likely to perceived outcomes as fair than losers of a seven-round card game. Thus, we might expect that students with better performance will be more likely to attribute their educational outcomes to their merit. Molina and colleagues (2019) also manipulate the level of opportunities by allowing the exchange of a certain number of cards. When more cards are allowed, the scenario is more redistributive. In all the conditions of a low level of redistribution, winners were more likely than losers to see the outcome

as fair and attributable to talent. In more egalitarian conditions, differences are reduced but not eliminated. These conditions are highly relevant in the Chinese context since the level of inequality has reached very high levels (Gini coefficient between 0.53 and 0.55) in the last years (Xie and Zhou 2014). In the educational system, inequality has increased according to the positional approach to measuring education (Hannum et al. 2019). Thus, the differences in normative beliefs of success between winners and losers in the educational system might sharpen in the China case.

Overall, the literature suggests that meritocratic narratives are justifiers of success and social inequalities, leading to the suggestion that parental meritocratic beliefs could justify students' academic performance. Parents of students with higher grades, as winners of the educational tournaments, will be more likely to attribute their success to talent than parents of students with lower grades.

Integration of reciprocal effects

The culture-as-rationalization approach criticizes the traditional understanding of culture as guiding action by ends and values (Swidler 1986). Instead, this approach conceives culture as providing a repertoire of justifications that limits and makes sense of the available possible strategies of action (Swidler 1986, 2001). This fashionable reversal of the sociological tradition was sustained by the observation that people seldom give consistent explanations of their behavior (Swidler 2001). Therefore, culture may not be a motivator of action.

However, advances in cognitive science have been echoed in sociology (Lizardo et al. 2016; Vaisey 2009) to vindicate the motivational role of culture in the dual process model, which is compatible with practice theory in sociology (Bourdieu 1979; Ortner 2006). In cognitive science, there is great interest in the analytical division between two systems underlying human reasoning, which has led to the proposal that humans have two minds (Evans 2003): one system that is automatic and unconscious (Type I), and another that is conscious and controlled (Type II). With the former,

individuals automatically respond to stimuli by using internalized inputs at hand (Vaisey 2009). Thus, culture can shape institutions and action through the unconscious mind as well as providing useful repertoires of strategies.

The dual process model of culture proposes that individuals are both influenced by internalized cultural schemas and capable of rationalizing when required by social interaction (Vaisey 2009; Vaisey and Lizardo 2010). This model enables investigation into how parental meritocratic narratives shape children's educational performance, as well as how parents simultaneously rationalize academic success as meritocratic. Parental beliefs about meritocracy are semantic knowledge as impersonal propositions about the world. They are part of the declarative culture of parents (Lizardo 2017). In a dual process model, children may store these beliefs in their non-declarative semantic memory. It is highly likely that parental beliefs may be adopted as part of children's cognitive schemas, since parents are significant others in the process of socialization and their attributional beliefs about children's success are consequential for their educational achievement (Murphey 1992; Tõeväli and Kikas 2017). At the same time, they could rationalize and make sense of children's academic achievement through meritocratic beliefs. Thus, reciprocal effects of performance and meritocratic beliefs are theoretically plausible[1].

H1a: Students whose parents hold beliefs about skills as a predictor of academic achievement will have better educational performance.

H1b: Students whose parents hold beliefs about hard work as a predictor of academic achievement will have better educational performance.

[1] The reciprocal relationship could include direct or indirect bidirectional effects between achievement and beliefs. It does not seek to provide a bidirectional causal explanation, but a bidirectional mechanistic explanation instead. A mechanism explanation (Machamer, Darden, and Craver 2000) is a kind of causal explication where no full story could be told. However, causal paths are identified to provide an explanation of phenomena.

H2a: Parents of students with higher academic performance are more likely to hold beliefs about skills as a predictor of academic achievement.

H2b: Parents of students with higher academic performance are more likely to hold beliefs about hard work as a predictor of academic achievement.

The relevance of this theoretical reasoning and the analytical strategy proposed in the following section may be illustrated with the recent evidence presented by Mijs (2019). His study aims to explain the paradox where citizens of the most unequal countries believe that their society is the paragon of meritocracy. By using data from 25 years of the International Social Survey Program, he shows that inequality is legitimated by meritocratic narratives. However, "*it could be that the relationship between beliefs and inequality goes in the other direction*" (Mijs 2019:16) or the two factors could be part of a dual process.

Insofar as declarative meritocratic beliefs may become internalized dispositions, they might explain positions in the social structure, which is made manifest in different levels of inequality. The same problem is encountered when examining the relationship between academic success and parental meritocratic narratives, which is a criticism of cultural explanations of ethno-racial gaps (Lizardo 2017). Parental beliefs may be encultured by children to affect their actions. Therefore, if parental meritocratic beliefs are coupled with children's dispositions that foster scholastic achievement, I expect a stronger effect of meritocratic beliefs when parent-child relationships provide the conditions for such acquisition of culture. Similarly, children's educational performance may send stronger signals when parents and children have a close relationship. Therefore, I hypothesize the following difference between groups:

H3: Reciprocal effects of meritocratic beliefs and educational performance are stronger for children with a close relationship with their parents.

Moreover, due to rapid economic growth and urbanization in China, one of the most important cultural cleavages is the rural-urban divide. Around 40 percent of the total population in China resides in rural areas (World Bank 2018), where they essentially live an agricultural lifestyle. Hence, unlike global Chinese cities such as Beijing and Shanghai, rural areas preserve traditional values (Chen and Chiu 2010; Fuligni and Zhang 2004; Wu 2017). Filial piety, loyalty and self-sacrifice and a general Confucian consciousness (Yang et al. 2006) still explain individual beliefs, attitudes and behaviors in rural areas. In addition, besides promoting thrift and respect for authority, Confucian values also advocate for educational achievement and hard work (Lim 2003; Stankov 2010). Lee (1999) pointed out that in the Confucian tradition the emphasis on effort is explained by a strong belief in achievement for all people, and the attribution of failure to lack of willpower. Internally, education is important for personal development. Externally, education is a driver of social mobility in an egalitarian sense: "*you can achieve if you want*" (Lee 1999:36). In addition, this faith in effort is coupled with the belief that educational success is not only seen as an individual achievement but is also associated with family honor (Peng 2019). This prediction is also consistent with the findings for the general population in China. Rural residents are more prone to perceived Chinese society as meritocratic (Xian and Reynolds 2017). Besides their strong traditional culture, it is explained because of the social isolation of rural populations that reduces the opportunities for social comparison. Thus, in rural schools, parental meritocratic beliefs may have stronger efficacy and are salient cultural repertoires for making sense of achievement[2]. Consequently, this literature leads to the following hypothesis:

H4a: Reciprocal effects of meritocratic beliefs and educational performance are stronger in rural areas than in urban areas.

[2] Differences between rural and urban areas are considered one of the most important sources of inequality in post-reform China (Wu 2019). The Chinese registration system (*hukou*) divides the country into two societies, where residents of rural areas are entitled to fewer rights and benefits of the urban population. The system requires people to register in the area where they reside, being classified in agricultural or non-agricultural.

However, modernization theories state that ascribed characteristics weaken their effects on status attainment, increasing the effectiveness of individual achievement in this process (Treiman 1970). In this context, the modernization of China may also cultivate norms, values, and beliefs consistent with this meritocratic understanding of development. Past studies have shown that the level of meritocracy in certain countries predicts support of meritocratic principles, as well as a more advantaged individual social position (Bucca 2016; Duru-Bellat and Tenret 2012; Kunovich and Slomczynski 2007). Individuals realize and internalize the idea that meritocracy explains rewards in rationalized and modern societies. Therefore, modernization reinforces meritocratic beliefs available as an explanation of success in urban areas and a motivator of actions that promote better performance. A competing hypothesis is thus derived:

H4b: Reciprocal effects of meritocratic beliefs and educational performance are stronger in urban areas than in rural areas.

Analytic strategy

From the theoretical arguments proposed in the previous sections, I derive reciprocal effects between children's educational performance and parental perception of meritocracy in the educational system. Autoregressive cross-lagged panel models (ACLPM) are a specific type of structural equation model (SEM) that can be used if two or more variables have been measured longitudinally, and the interest is in their reciprocal effects. Like any SEM, ACLPM allows both latent and observed variables to be included. Moreover, the standardization of coefficients enables effects to be compared between paths.

As Huijsmans and colleagues explain (2019), two kinds of effects can be estimated using ACLPM. First, autoregressive effects examining the average stability of a variable in students from one point in time to the next. For instance, the autoregressive path from beliefs about skills at Time 1 to beliefs about skills at Time 2 shows how stable this belief is between these two waves of the panel. These effects are represented by the solid lines in Figure 2.

[Figure 2]

Second, cross-lagged effects indicate the effect of one variable on another measured at the following time. These effects represent the theoretical hypotheses of motivational and justificatory effects of meritocratic beliefs. They are represented in Figure 2 by dotted lines and dashed lines, respectively. For example, the effect of educational performance in Wave 1 on parental beliefs about skills in Wave 2 refers to the justification path for that belief. Due to the inclusion of the autoregressive effects, this path is independent of the belief at Time 1. This makes it possible to rule out that the effect of academic achievement on beliefs exists simply because these variables are correlated at the first measurement point. Controlling cross-lagged effects by autoregressive paths enables the direction of the potential causality to be tested. In addition, dash-dotted lines represent the effects between parental beliefs about skills and parental beliefs about hard work, which are intended to test the consistency of these beliefs in our context. Lastly, covariances are included for all the variables in the same period.

For the sake of simplicity, control variables at Time 1 were omitted from the figure and are specified in the next section. Following a standard procedure in ACLPM (Allison 2002; Hawkins, Amato, and King 2007; Huijsmans et al. 2019), I rely on full information maximum likelihood estimation (FIML) rather than a listwise deletion of cases as in a traditional regression approach. This method provides better estimates of the parameters in comparison to listwise deletion, where missing data are assumed to be random. Dummy variables (*hukou*, migrant status, male, urban, close relationship) are specified as exogenous variables, which means that cases with missing values on these measurements are excluded. I use a weighted least square parameter (WLSM) estimator for binary outcomes.[3] This estimator has been suggested (Muthén and Muthén 2010) for models where there is at least one binary outcome.

[3] Models are estimated using the WLSMV estimator, which is also suggested for binary outcomes. Although both produce similar results, WLSM yielded a better fit than WLSMV.

Data and Methods

I analyze data from the first and second waves of the China Educational Panel Survey (CEPS). The sample comprises 10,279 seventh graders surveyed in 2013-2014 with a follow-up in eighth grade. This survey is a longitudinal, large-scale, probabilistic and representative sample of seventh and ninth graders from 438 classes at 112 schools in 28 counties in mainland China. Of the 10,279 seventh graders in the baseline, 9,440 students were surveyed in the follow-up in eighth grade. Total attrition is about 8.16 percent of the original sample. The analyses in this work only consider parent questionnaire answered either by the biological father or the biological mother. Therefore, the final analytic sample includes 9,163 observations.

Main variables

ACLPM uses variables that are both predictors and outcomes at different time points. First, parents were asked, among a list of factors, whether "the extent of hardworking" and "talent and capability" have effects on students' grades, where 1 is yes and 0 is no. These are parents' narratives about hard work and skills, respectively.

Second, educational performance is measured as a latent variable based on the class ranking in Math, Chinese and English mid-term exams for each year. I compute students' ordinal rank -the higher the rank, the higher the grades- as their decile in each exam session evaluation across classmates. Since the absolute rank measure does not account for different class sizes, the decile rank (Ω) is standardized to class size:

$$\Omega_{icst} = \frac{\alpha_{icst} - 1}{N_{icst}} \quad X\ 10 \qquad (1)$$

where, α is the absolute rank of student *i* within class *c* and school *s* for wave *t*. Therefore, each subject class rank varies in a range from 0 to 10, where 0 refers to the student at the bottom of the

distribution and 10 to the students at the top. Thus, each unit of increase or decrease represents a change of 10 percentiles. Factor loadings indicate a positive and strong relationship between the latent variable performance and the three observed measures in each wave.

Control variables

As mentioned, several control variables were included from the survey baseline as exogenous and endogenous variables. First, three binary indicators were included as exogenous in the models. A dummy variable indicating whether the student was male (1 = yes, 0 = no) was included, because there is evidence suggesting gender differences in the effect of parental beliefs about success on children skills (Mägi et al. 2011). In addition, binary indicators were incorporated, denoting whether the student holds agricultural *hukou* (1 = yes, 0 = no), the geographic area of the schools (1 = urban, 0 = rural), and migration status (1 = yes, 0 = no). These variables have been suggested as important sources of educational disadvantage in China (Hannum et al. 2019; Tam and Jiang 2015). Finally, I used a dichotomous indicator of the parent-child relationship where 1 denotes children declaring a "very close" relationship with the parent who responded to the questionnaire. Thus, 0 corresponded to children with a "not close" or "not too close nor too far" relationship.

An additional block of five endogenous control variables was included in the model, of which two were predictors intended to control for objective conditions of skills and hard work beliefs: cognitive ability and average hours spent on homework. First, cognitive ability was measured by a raw cognitive ability test score estimated using an item response theory model. The test assesses students' aptitudes over 22 items on reasoning and problem-solving, which must be answered in up to 15 minutes (Zhao et al. 2017). Besides the logic effect on academic performance, previous studies have shown a consistent relationship between children's cognitive performance and parental beliefs (Sigel and McGillicuddy-De Lisi 2002). Second, regarding homework, students were asked how much time they had spent on homework assigned by their teachers at school the previous week. The hours spent from Monday to Friday were added to the hours spent on weekends. I did not consider

minutes because of the unreliability of this measure. A logarithmic transformation of this variable was used. The third endogenous variable, in order to take account of the children's development, was student age. The fourth variable was the educational level of the father and mother, measured on a range from 1 to 9, where 1 is "no education" and 9 is "master's degree or higher". It has been reported that the educational level of both parents affects the path from parental beliefs to children's outcomes (Sigel and McGillicuddy-De Lisi 2002). The fifth variable was the number of siblings (including the respondents), intended to address the effect of sibship size on educational outcomes, which is an important confounder in the Chinese case (Lu and Treiman 2008). In addition, the control by parents' educational level, number of siblings and *hukou* enables us to show that it is the parents' beliefs that influence student performance, and no other resources they can offer.

Results

Before reporting the testing of the hypotheses, Table 1 shows the descriptive statistics involved in the analyses. As expected, the mean value of class rank at every mid-term for Waves 1 and 2 is around the 50th percentile. Regarding meritocratic beliefs, there is an important descriptive result to be highlighted. For each wave, the proportion of parents who consider that skills lead to better performance is smaller than those who perceive the payoffs of hard work. Three of every 10 parents believe that talent and capabilities are predictors of better academic achievement. In contrast, eight of every 10 believe that students who make a greater effort will obtain higher grades. This suggests that beliefs about skills and hard work do not go hand-in-hand in the Chinese context.[4] This is confirmed by low unweighted tetrachoric correlations when students were 7th grade (r = 0.16) and 8th grade (r = 0.23). Table 1 also shows the proportion of parents who changed their beliefs between Wave 1 and Wave , with 36 percent changing their beliefs about skills, while 22 percent changed their endorsement of hard work as a predictor of success. Both are substantive proportions of change.

[4] Descriptive statistics of control variables are reported in Table 1A of the supplementary material.

It is worth noting the high level of consensus about the perception of hard work payoffs, which indicates this narrative seems to be a strong belief in Chinese public culture. Despite the lower level of variance of this variable, the large sample size enables the theoretical hypotheses to be accurately tested.

[Table 1]

Table 2 shows the results of the cross-lagged model testing the hypotheses of the dual process of parental meritocratic beliefs. In addition, this model includes stability paths and the relationships between meritocratic beliefs (consistency path). Overall, the goodness of fit indices indicate that our model fits the observations accurately (RMSEA= 0.033, CFI=0.958, TLI=0.914). Standardized and unstandardized coefficients are reported. Effects on binary outcomes are reported in log-odds. The standardization of variables predicting binary outcomes also addresses the limitations of logistic regressions underlined by Mood (2010). Sociologists usually ignore the fact that logistic regressions are biased by omitted variables that are unrelated to independent variables, unlike linear regressions. Therefore, coefficients across models in the same sample are incomparable. Doing so requires a y-standardization (Winship and Mare 1984), which divides the coefficients by the standard deviation of the latent variable for each equation of the structural model (sdY*). These standardized coefficients are reported in Table 2 for binary outcomes. First, stability paths show divergent results for educational performance and meritocratic beliefs. Every variable in Wave 2 is significant and positively related to its value in Wave 1. However, while educational performance is more stable (β =0.687, $p<0.001$), autoregressive effects of beliefs about skills (β=0.328, $p<0.001$) and hard work (β=0.345, $p<0.001$) are smaller. Once again, this suggests a substantive degree of variability between waves.

Table 2 also shows the relationship between meritocratic beliefs. If the classic conceptualization of merit as a function of skills and effort is accurate, a high association between meritocratic narratives is expected. Although they have a positive and significant relationship, the

effect size is smaller in comparison to other paths. Parents who believe that hard work leads to better educational performance are 1.16 (OR = exp(0.150)) times more likely to hold beliefs about skills. In a similar fashion, parents who believe in skills as a predictor of academic success are 1.10 (OR = exp(0.098)) times more likely to be believers in hard work. As well as descriptive statistics, this indicates that beliefs about skills and hard work as predictors of students' success work differently in the Chinese context.

Finally, Table 2 reports the results for the testing of the hypotheses of the dual process of meritocratic beliefs. The last column indicates that neither parental beliefs about skills nor those about hard work are significantly related to educational performance in Wave 2. Parental perception of meritocracy does not influence children's educational performance. Hence, these results do not support the hypotheses on motivation (H1a and H1b). Conversely, educational performance in Wave 1 is a significant predictor of narratives about both skills (β=0.028, $p<0.01$) and hard work (β=0.105, $p<0.001$). These coefficients could be expressed in terms of odds ratios as a magnitude of their effect size. They indicate that an increase of 1 standard deviation in the class rank of educational performance leads to a 1.03-times increase in the likelihood of holding skills beliefs, while for beliefs about hard work this increase is 1.12 times. The difference in magnitude between these two coefficients is a straightforward indicator of a substantive effect on hard work beliefs, and a less strong effect on attributional beliefs about skills. The Wald test for the difference between these two justificatory effects supports this claim ($p<0.001$).

[Table 2]

Nevertheless, although the justificatory paths are significant, the formal test of the difference between the motivational and justificatory effects is not significant. Thus, the results on whether meritocratic beliefs have a more justificatory than motivational role in the case of China are inconclusive. Table 3 shows the results of a formal test of the difference between motivation and justification path in Panel A. The justification role of attributional beliefs (educational performance

→ skills belief; educational performance → hard work) is not significantly different ($p>0.05$) from its motivational path (skills belief → educational performance; hard work belief → educational performance) as suggested by the Wald chi-square tests. Finally, Panel B shows that the effect of educational performance on narratives about skills and hard work are heterogeneous. In the Chinese context, the justificatory effect of educational performance on beliefs about hard work is stronger than the effect on beliefs about skills. Therefore, as suggested above, skills and hard work narratives do not go hand-in-hand in this dual process of parental meritocratic beliefs.

An additional model is estimated where motivational paths are constrained to zero (skills belief → educational performance; hard work belief → educational performance). The goodness of fit indices for this model improved slightly in comparison with the previous model (RMSEA=0.030; CFI=0.958; TLI=0.927). This is another argument for disregarding the motivational effects of parental beliefs on performance. In addition, different specifications of the model were estimated. The baseline model without controls is reported in the supplementary material (Table 2A) as well as the model omitting hours of homework (Table 3A). In both cases, the motivational effect is not statistically significant and in a similar magnitude. Thus, the evidence does not support the direct effect of beliefs or the indirect effect through effort in these specifications.

Overall, the findings indicate that parents' meritocratic beliefs have no significant effect on children's educational performance. However, educational performance has significant effects on both beliefs about skills and hard work as predictors of children's achievement. Therefore, parents' meritocratic narratives justify educational performance.

[Table 3]

The robustness of the results was tested against different criteria of educational performance. First, since the tracking process at secondary level has notable consequences for students' educational attainment in China (Anderson et al. 2016; Ye 2015) and comparative evidence has supported its

effects on student's causal attributions (Mijs 2016a), I used grade rank instead of class rank. Through this measure, I avoided the possibility of class sorting. As shown in Table 4A in the supplementary material, the main effects are confirmed and in a similar magnitude. Second, I used the parental subjective assessment of children's performance. Parents were asked: "*How does this child's academic record rank in his/her class at present?*". Their answers could range from 1 to 5, where 1 was "Near the bottom" and 5 "Around the top". Once again, Table 5A in the supplementary material confirms our results. In this case, belief about hard work increases the subjective assessment of children's performance (B=0.087, p<0.000), in the same way as objective assessment. However, the Wald test indicates that the justificatory path of belief about hard work is stronger than its motivational path (p<0.05, X^2=5.868).

In addition, following Hu (2018), I tapped into unusual information provided by CEPS, which allowed me to restrict the sample to schools where their principals confirm the random allocation of students across classes at seventh grade, and no achievement-based reallocation either at eighth or ninth grade. Moreover, a third restriction is established regarding whether the homeroom teachers reported no student tracking according to academic achievement. Table 6A in the supplementary material suggests similar findings to those obtained using the full sample. Therefore, I can conclude that the estimation is robust against measurements of academic achievement and the effects of ability tracking.

Two additional multigroup analyses were conducted to test the equality of the parameters across groups (Table 4). A multigroup model uses the same principle as interactions but applied across the structural equation model. This approach is more efficient than standard moderation, which focuses on a single structural relation at a time (Matthews 2017). First, the justificatory effect of performance on beliefs about hard work is significant for parents with close (B=0.117, p<0.001) and non-close relationships (B=0.067, p<0.05). For skills, it is only significant in the case of close relationships (B=0.035, p<0.01). Although the magnitude of the effect is larger for close parent-child

relations, the difference is not significant according to the Wald test. However, what is important in this case is that the quality of the parent-child relationship does not influence the potential motivational effect of meritocratic beliefs. Thus, the evidence does not support Hypothesis 3. The null hypothesis is highly relevant because, as a propitious condition for the internalization of parental declarative culture, a close parent-child relationship does not increase the motivational effect of parental meritocratic beliefs on children's educational performance.

Finally, the results regarding the competing hypotheses of Confucian tradition and modernization theories are also shown in Table 4. Parental meritocratic beliefs do not motivate action either in rural or urban schools. Moreover, in both cases, higher educational performance predicts the endorsement of beliefs about hard work. A Wald test on the difference between these two coefficients indicates that the effect is stronger in schools located in rural areas ($p<0.05$, $X^2= 5.648$). In addition, the justificatory effect of the belief about hard work as a predictor of success is stronger than its motivational effect ($p<0.05$, $X^2= 4.062$) in rural schools. This supports hypothesis (H4a) on the Confucian tradition but specified only to its justificatory effect. The argument that urbanization makes meritocratic beliefs more salient due to modernization is not sustained by the results.

The comparison of logistic regression is not only difficult between models as mentioned before, but also across samples (Allison 1999; Williams 2009). The robustness of the multigroup analysis requires addressing the potential bias of unobserved heterogeneity across samples. To assume that all the variables predict the outcome equally well across groups (e.g. close/non-close, urban/rural) is unrealistic and difficult to support theoretically. I use linear probability models (LPM) for each multigroup analysis as proposed by Mood (2010). His simulations show that LPM coefficients are unbiased and consistent estimates of a variable's average marginal effect on P(y=1), which is not affected by unobserved heterogeneity like logistic regressions. With these models, my conclusions are not substantively altered.

[Table 4]

Conclusion and discussion

The aim of this study was to understand the reciprocal effects of parental meritocratic beliefs as the perception of meritocracy in the educational system and children's educational performance in China. The findings indicate that parental narratives of meritocratic success do not have an effect on the educational performance of children. Instead, meritocratic beliefs are affected by academic results, suggesting they have a justificatory role. This pattern is much clearer in rural China, where traditional Chinese culture is preserved. In addition, this study sought to explore the consistency of two narratives of meritocratic principles: hard work and skills. The results indicate that in China they are moderately related, and beliefs about hard work are used to make sense of better children's educational performance in a more salient manner. This finding is surprising due to its lower level of variance in comparison to beliefs about skills. It is consistent with the idea that Confucian tradition promotes willpower as a mean of success (Lee 1999), and that abilities may be rewarded if effort is made. For Confucius, any man might become a "gentleman", and in education there should be no class distinctions (Creel 1953). The meritocratic narrative in China is consistent with the so-called "meritocratic component of meritocracy" in Western societies (Bucca 2016; Mijs 2019).

Another interpretation of the difference between beliefs about skills and hard work is the difference established by the attributional theory (Weiner 1989), used to predict the effect of beliefs on children's achievement. Following the attributional argument, hard work should have a stronger effect on achievement than skills, because in addition to being internal, it is more controllable and changeable than skills. Therefore, it has a greater effect on emotions and behaviors. In the case of this study, the justificatory effect of hard work is stronger than skills. Therefore, using hard work as a narrative of success enhances the deservedness of the individual even more because it is more volitional than skills.

The findings of the present study have important implications for the growing body of research on citizens' inequality beliefs (Castillo 2011; Hunt 2007; McCall 2013; Mijs 2019; Xian and Reynolds 2017). This study has shown that the relationship between academic success and meritocratic beliefs is not bidirectional as theorized, but, rather, these factors justify such a relationship. I have provided a theoretical model and a longitudinal test of the legitimation hypothesis suggested by this tradition and the motivational hypothesis, which is used to explain ethno-racial gaps in sociology (Hsin and Xie 2014; Liu and Xie 2016; Ogbu 2003). In a dual process model of parental beliefs, only culture-as-rationalization (Swidler 1986, 2001; Vaisey 2009) is supported. This evidence joins skeptical views of Confucian values as affecting higher educational performance in the United States (Lee and Zhou 2015). Further studies may extend this model, considering the reciprocal effects in different societies and systems, such as the labor market or religion.

The lack of effect of parental beliefs on children's educational performance should not be interpreted as the impossibility of motivating students. Instead, these findings suggest a decoupling between parents' declarative culture and children's dispositions that could enhance educational performance. As Lizardo (2017) argues, a superficial understanding of these cultural processes has led motivational studies towards a declarative culture bias. Further studies might address whether parental beliefs fail to motivate educational performance or whether there is a decoupling between declarative and non-declarative forms of culture. In addition, this study has focused on the perceived meritocracy of the educational system. As suggested by previous studies, it is important to distinguish between preferences about inequality and perceived inequality (Castillo 2011). However, CEPS do not provide normative measurements or meritocratic preferences. More research is needed to reveal any potential motivational effects of these alternative cultural orientations.

This study has also demonstrated the role of parental meritocratic narratives in an East Asian country. To the best of my knowledge, this is the first study simultaneously considering meritocratic beliefs and educational performance in this region. Meritocratic selection of civil servants is

widespread across countries such as Korea, Japan, and China, where it provides the building blocks of an exam-oriented educational culture (Hannum et al. 2019). In these countries, Confucian philosophy has led to long-lasting competitive pressures on families, schools, teachers, and students. In the case of China, the response has been in the form of supplementary education (Liu and Bray 2017; Zhang and Xie 2016), international opt-out (Liu 2018; Young 2018) and curricular reforms (Sargent 2009). However, the descriptive relevance of meritocratic beliefs in the belief system says nothing about their relations with action or structure. Meritocracy is a dominant normative principle, and parental meritocratic narratives justify success in the Chinese exam-oriented system. As once stated by Weber, "*every highly privileged group develops the myth of its natural superiority*" (1978:953), and in the Chinese educational system the myth seems to be that of skills and hard work.

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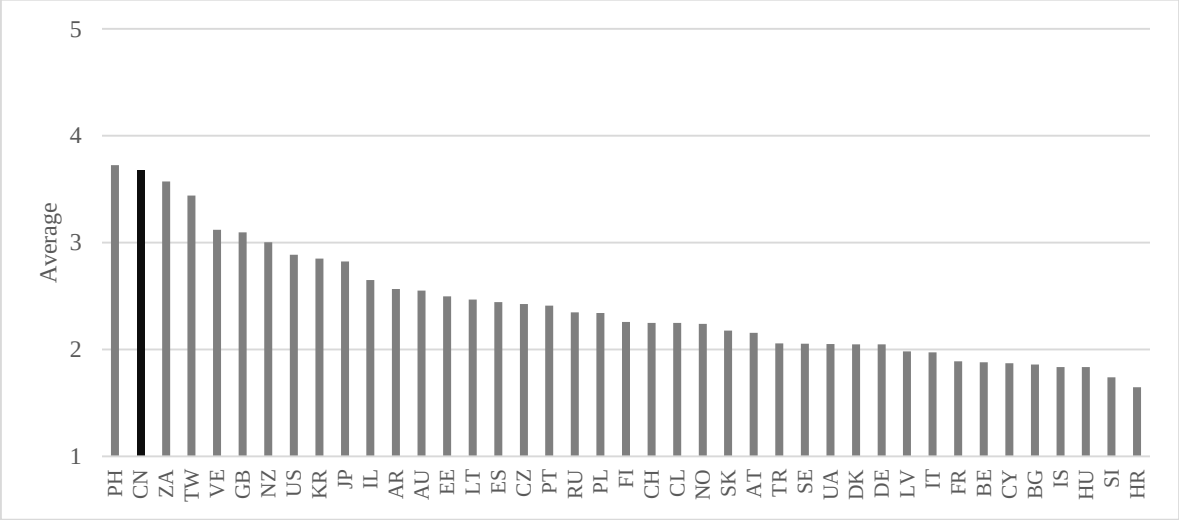
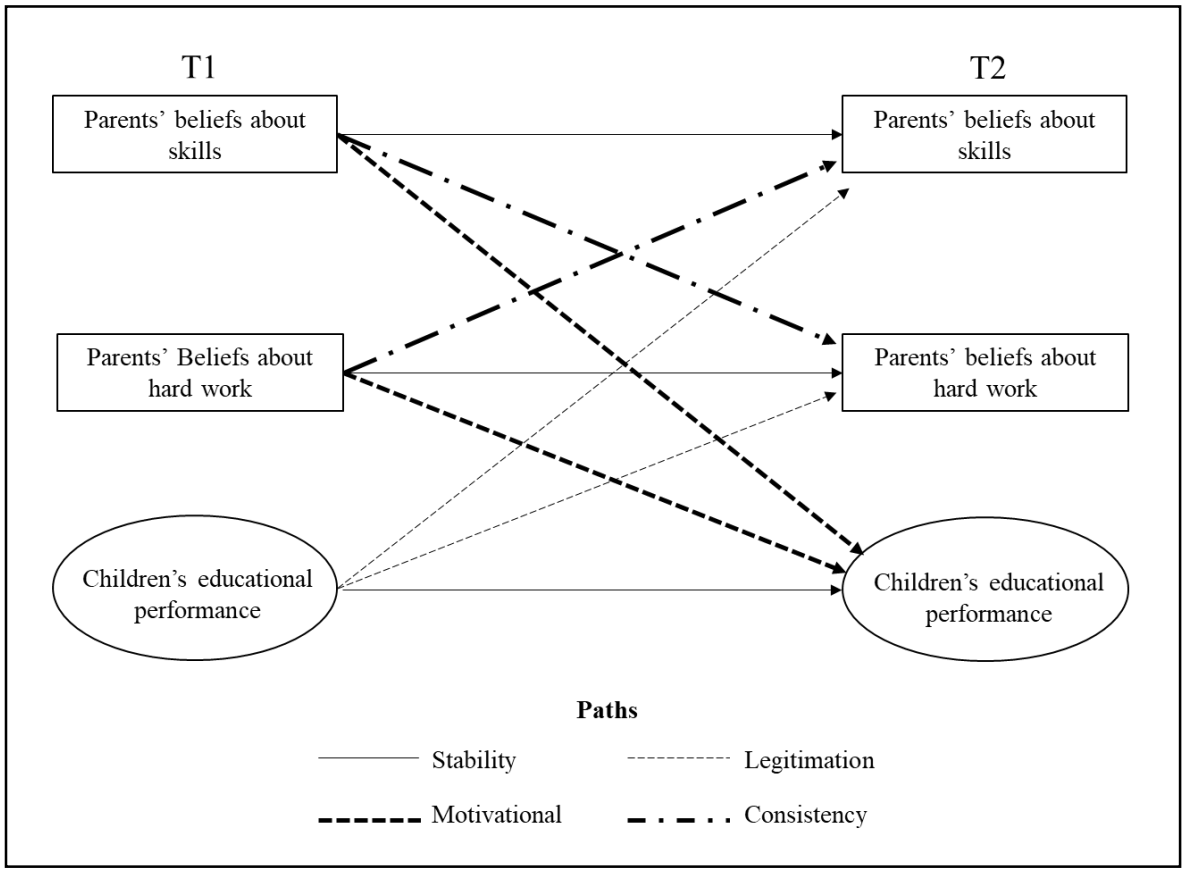
Figure



Note: Own elaboration from the 2009 International Social Survey Project. Weighted statistics. Values are reverse with 1 “Very unjust, definitely wrong” and 5 “Very just, definitely right”.

Figure 1. Is it just or unjust that people with higher incomes can buy better education for their children than people with lower incomes?



Note: Control variables and residual covariances are not included in the figure. Latent variable (circles) formed by children's class rank in Math, Chinese and English. Observed variables represented by squares.

Figure 2. Theoretical model.

Table

[checkCIF Results]