Measuring Perceptions and Preferences for Meritocracy

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Abstract

Economic and social inequalities have generated growing concern and crises across contemporary societies. One of the mechanisms proposed by the social sciences to explain the maintenance of inequality is the belief in meritocracy, which would legitimize economic disparities based on differences in effort and talent. Despite its wide use as a concept, empirical research on meritocracy is relatively novel, and as it is based upon multiple approaches and techniques, its interpretation can be difficult and confusing. Adding to these difficulties, is the fact that many such studies have relied upon secondary data to operationalize meritocracy, with significant variation in the use and interpretation of survey items. Based on a review of studies that measure meritocracy, this article identifies a series of drawbacks and inconsistencies within and between studies regarding the conceptualization and indicators of meritocracy. Based on this critical analysis, we propose a scale named the *Perceptions and Preferences for Meritocracy Scale*, which we test with confirmatory factor analysis, using data from an online survey study (N=2,141). Our results support the proposed conceptual structure, which not only distinguishes between perceptions and preferences, but also between meritocratic and non-meritocratic dimensions. Our discussion highlights the importance of considering these different dimensions in order to advance the study of meritocracy.

1 Introduction

Economic inequality has become an issue of growing concern around the world. This has been expressed in a series of protests, as well as diverse critical analyses regarding the development of capitalism and its consequences (Streeck 2014; Piketty 2014). In this context, the study of visions, preferences and perceptions of inequality has acquired relevance in the social sciences, in topics such as redistributive preferences (Alesina and Angeletos 2005; Dimick, Rueda, and Stegmueller 2018), the legitimization of economic inequality (Schröder 2017) and the functioning of meritocracy (Duru-Bellat and Tenret 2012; Mijs 2019; Reynolds and Xian 2014; Atria et al. 2020).

In general, a meritocracy is defined as a system of distribution of resources and rewards based on individual merit, which in its original conception is a combination of talent and effort (Young 1962). This traditional conception of merit, places in a secondary position the possible interference of structural or non-meritocratic factors, such as inheritance, personal contacts, and luck (Breen and Goldthorpe 1999; Saunders 1995; Yair 2007; Land 2006; Young 1994). Social psychology and sociology have studied the characteristics and consequences of beliefs in meritocracy, under the general hypothesis that a greater belief in meritocracy leads to greater legitimization of inequalities (Preminger 2020; Trump 2020; Hadjar 2008; Madeira et al. 2019). Such research has raised criticism of meritocracy as a moral standard of distribution, arguing that it would be an unfulfilled promise, given the preponderant influence of non-meritocratic elements upon individual status (Sandel, -, and OverDrive 2020; Witteveen and Attewell 2020; Arrow, Bowles, and Durlauf 2000; Goldthorpe 2003; Markovits 2019; Khan 2013).

Due to the role that meritocratic beliefs play in the justification of individual achievement or failure in contemporary societies (Bay-Cheng et al. 2015), multiple investigations have evaluated the relationship between meritocratic beliefs and personal/contextual characteristics. For example, some studies have linked meritocracy to the reinforcement of socio-economic, gender, and ethnic stereotypes (Madeira et al. 2019; Girerd and Bonnot 2020a; Preminger 2020), as well as lines of research

have evaluated the effects of meritocratic beliefs in educational (Generett and Olson 2020; Owens and St Croix 2020) and organizational contexts (Pérez and Sabelis 2020; Aiello, Cardamone, and Pupo 2019).

To measure beliefs in meritocracy, studies have generally used indicators from existing surveys, and to a lesser extent, have created ad-hoc instruments. However, as we will show later, the methods of measuring meritocracy vary extensively among studies. In many cases, similar phenomena are associated with different indicators, and conversely, often different phenomena are measured with similar indicators. Such trends confound not only the comparability of studies, but also the ability to understanding the effects of meritocratic beliefs across different fields.

Based on a critical analysis of different approaches to the measurement of meritocracy to date, this article proposes a tool to both measure and relate two key aspects in the study of meritocracy: perceptions and preferences. Furthermore, as a second axis of analysis, it considers the elaboration of indicators regarding meritocratic and non-meritocratic aspects, demonstrating that they are not two poles of the same continuum, as some previous studies would seem to suggest. The measurement system outlined is oriented to generate an instrument as simple and brief as possible, so that it can be used in public opinion surveys, thus integrating meritocratic beliefs in the study of different social phenomena.

The black-box of meritocratic beliefs

Several approaches to the empirical study of meritocracy based on public opinion surveys, refer to the concept of *beliefs*, however different meanings and operationalizations usually underlie this concept. To illustrate this point, we will take as a main reference a recent paper about meritocracy by Mijs (2019), which makes several assumptions relating to the measurement of meritocracy that are also found in previous studies. The definition of meritocratic beliefs stated by Mijs is the following: "when I discuss meritocracy beliefs, I am referring to citizens' belief in the importance of hard work relative to structural factors." (Mijs 2019, pg.9). In the subsequent operationalization, this is associated with the following question and indicator: "how important you think it is for getting ahead in life: (a) hard work", scored from 1 to 5 on a likert scale. There assumptions behind this definition are worth discussing in light of the conceptual meaning of meritocracy and its possibilities of operationalization.

    a. *Unidimensionality*; Is merit only effort?

The item used by Mijs (2019) is part of an items' battery present in several international surveys, usually called "reasons to get ahead". This battery displays a series of indicators related to what people consider important to get ahead in life: hard work, education, ambition, a wealthy family, the right connections, religion, race, and gender. Therefore for Mijs, other aspects that could be associated with talent, such as education, are not meritocratic. As he points out: "Hard work is arguably the most meritocratic part of Michael Young's equation: 'Merit = Intelligence + Effort', for the simple fact that intelligence itself is influenced by a non-meritocratic factor: who your parents happen to be" (p.5).

In this measure of meritocratic belief, we can observe a couple of strong assumptions: effort would not depend on parental influence, and talent (as innate ability) is not meritocratic (contrary to Michael Youngs original conceptualization). The question of whether talent is or is not considered meritocratic is certainly an interesting topic to discuss from a philosophical point of view, but for those working on empirical studies it is something that should face empirical scrutiny. Is effort the only dimension

behind the concept of meritocracy, or is it a multidimensional concept that includes other elements, such as talent (as in its original conceptualization)? This conceptual and measurement-based assumption of unidimensionality is found in other studies, that also assume effort to be the main and only aspect of meritocracy (Girerd and Bonnot 2020b; Bubak 2019). Conversely, recently Mijs and Hoy (2020) also considered talent as an indicator of meritocracy.

b. Beliefs

The most commonly used survey items for the operationalization of meritocracy is the "reasons to get ahead" battery, which asks "how important you think it is" and then lists several factors, such as effort, education, parental wealth, and contacts. Another version of this same battery used in several surveys - sometimes along the previous one - asks about "how important you think it *should* be". Therefore, the question raised here is: Which one of both is a "belief"? What *is* or what *should* be?

The term belief has an ambiguous character in the literature, conceived as "idea-elements" by Converse (1964) or "considerations" by Zaller (1992). As Kluegel and Smith (1986) pointed out about the scope of beliefs: "This usage encompasses such more specific social-psychological concepts as values, perceptions, and attitudes" (p.30). Therefore, beliefs cover almost anything related to subjective factors. To this regard, a relevant distinction in the field of inequality beliefs was made by Janmaat (2013): "Perceptions refer to subjective estimates of existing inequality (i.e. thoughts about what is). Beliefs are here defined as normative ideas about just inequality (i.e. thoughts about what should be)"(p.359). Several papers dealing with meritocracy use the term beliefs (i.e. what should be), while actually referring to perceptions (i.e. what is). This occurs not only in mijs_paradox_2019, but also in Reynolds and Xian (2014), in which the term beliefs is used to talk about perceptions, whereas other authors use general terms such as attitudes (Kunovich and Slomczynski (2007)). The first attempt to shed light on this issue was made by Duru-Bellat and Tenret (2012), who used the question "how important should the number of years spent in education and training be in deciding how much money people ought to earn?" as a proxy for "desired" meritocracy (beliefs). They then determined "perceived" meritocracy, using the questions: "Would you say that in your country, people are rewarded for their efforts?" and "... people are rewarded for their skills?".

Is the belief in meritocracy a perception or a preference with normative meaning? In order to expand the analytical conceptual framework, we believe that both dimensions should be included in analyses, as proposed by Duru-Bellat and Tenret (2012). This opens up the possibility of analyzing whether perceptions and preferences are actually related (i.e. have a correlation close to 1), or whether they are independent aspects of the same phenomenon. As Son Hing et al. (2011) have pointed out, "People can believe that outcomes ought to be distributed on the basis of merit and yet vary in their perceptions of whether this is how society currently operates" (p. 435). In other words, normative beliefs should be considered while taking perceptions into account: a strong normative belief in meritocracy may mean something totally different to someone perceiving high meritocracy, when compared to someone perceiving low meritocracy. To avoid the confusion generated by the term "belief", we propose the terms meritocratic preferences (what should be), and meritocratic perceptions (what is), as they better reflect the two facets of meritocracy under scrutiny.

c. Non-meritocratic aspects

Unlike studies that consider talent to be a non-meritocratic aspect, and therefore rule it out of the operationalization of meritocracy, Kunovich and Slomczynski (2007) follow a different approach, by including some non-meritocratic elements. Using an items' battery listing a number of factors in relation to "How important each should be in deciding pay..." (as Duru-

Bellat and Tenret ([2012](#)) for desired meritocracy), they consider factors such as education and responsibility as meritocratic, giving them a value of 1 if considered "essential" in the scale response, whereas factors such as having a family or children are valued 1 when rated as "not important at all" (i.e. reverse coded). The assumption behind this approach is that rejecting a supposed non-meritocratic aspect (as having family and/or children) implies a larger belief in meritocracy. A similar approach of reverse-coding non-meritocratic items was taken by Newman, Johnston, and Lown ([2015](#)), using the same principles applied in the "Preference for the Merit Principle Scale" (Davey et al. [1999](#)).

The assumption that meritocratic and non-meritocratic elements are poles of the same continuum was tested by Reynolds and Xian ([2014](#)) using the "get ahead" perceptions' battery items mentioned above. They considered education, ambition, and hard work as meritocratic, and other factors such as family wealth and connections as non-meritocratic. Despite making and proving this distinction, however, the authors end up subtracting one dimension from the other, thus coming back to the assumption that they are two poles of the same continuum as Kunovich and Slomczynski ([2007](#)) did. We suggest that non-meritocratic factors should be part of meritocratic measurements, but should be considered independently, rather than adding to or subtracting from meritocratic factors, unless it is empirically proved that they belong to the same conceptual dimension.

d. Accounting for measurement error

Finally, most of the studies in meritocracy so far have not accounted for the issue of measurement error (Brown [2010](#); Bollen [1989](#)) (Ansolabehere, S., Rodden, J., & Snyder Jr, J. M., 2008), when using single indicators and/or simple average indexes for measuring meritocracy. Such strategy assumes that the latent construct is measured perfectly by the indicators chosen, going as far as to propose that "... In choosing this strategy of index construction, we argue that *support for meritocracy is not a latent variable* (Kunovich and Slomczynski [2007](#), 653–54). Some advances were made by Reynolds and Xian ([2014](#)) through conducting a principal component analysis of meritocratic and non-meritocratic dimensions, but somewhat contradictorily, they chose a sum index, despite proving a multidimensional latent structure.

An instrument proposal

Based on the previous assumptions and limitations of the measurements of meritocracy, we propose and test an instrument with the following characteristics:

- *Multidimensionality*, incorporating previous distinctions between preferences and perceptions, as well as between meritocratic and non-meritocratic aspects.

- Multiple indicators for each dimension, in order to *account for measurement error* in a confirmatory factor analysis context.

- Based on *previous indicators* as much as possible, for the sake of comparability between studies.

- *Brief*, as to be used in regular public opinion surveys. In this respect, it differs from the proposal of "Preference for the Merit Principle Scale" (Davey et al. [1999](#)), as they use 15 items for just one dimension (aside from the problem of reverse-coding non-meritocratic items).

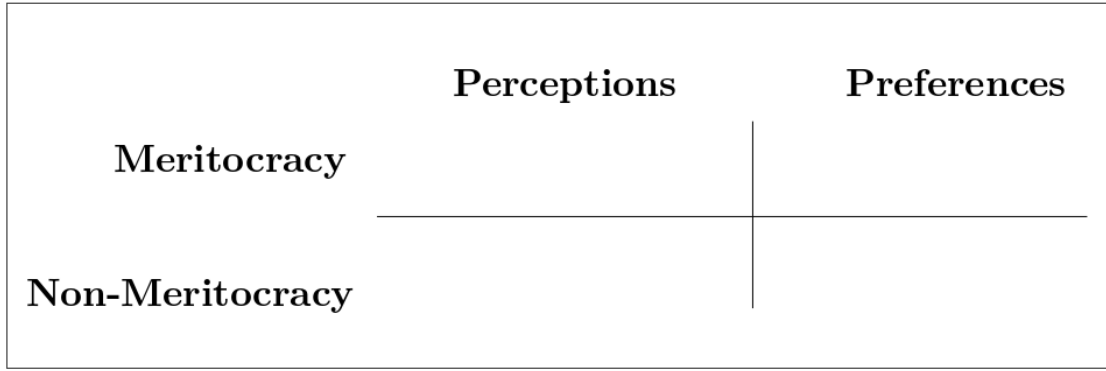The proposed measurement framework is depicted in Figure 1:

	Perceptions	Preferences
Meritocracy		
Non-Meritocracy		

Figure 1: Model of perception and preferences for meritocracy and non-meritocracy

The columns "Perceptions" and "Preferences" represent the distinction between these two concepts, usually confused under the label "beliefs". Perceptions refer to the extent to which people observe that meritocracy works or applies in their society, which relates to items such as "I think hard work is important to get ahead in society". Preferences refer to normative expectations that are usually linked to a "should" expression (e.g. whether hard work should be related to payment). The rows in Figure 1 consider the distinction between meritocratic and non-meritocratic dimensions (Reynolds and Xian 2014). These aspects have usually been treated as different ends of the same continuum in previous research, an assumption that requires empirical scrutiny. Non-meritocratic elements usually refer to the use of personal contacts or family advantages to get ahead in life.

Regarding the selection of indicators, most are taken or adapted from previous studies for the sake of comparability. For meritocratic indicators, we use effort and talent as the main components of the traditional concept of merit as defined by Young (1962), whereas for non-meritocratic dimensions, we use wealthy parents and good contacts. Descriptions of the specific items are outlined in the methodology section.

The research hypotheses behind this conceptualization and measurement model are as follows:

- H_1. The perception of meritocracy is a latent variable based on indicators of the importance attributed to talent and effort to get ahead in life.

- H_2. The perception of non-meritocracy is a latent variable that derives from two indicators related to agreement with the statement that people with contacts and rich parents manage to get ahead.

- H_3. Meritocratic preferences are a latent variable based on the normative value of effort and talent.

- H_4. Non-meritocratic preferences are a latent variable based on the normative value of the use of personal contacts and having wealthy parents.

2 Methodology

Data collection

The data was obtained through an online questionnaire, which was part of a larger study on meritocracy and preferences developed in Chile in 2019 funded by the national scientific agency ANID. The questionnaire was programmed in Qualtrics and the fieldwork was conducted by an external online survey agency (netquest.cl) between December 2019 and January 2020. The sample was selected from a non-probabilistic quota design in three large cities in Chile. The quotas for gender, age, and education level were generated based on a survey by the Public Studies Center (CEP 2019), which is a well regarded counterpart agency of the ISSP (International Social Survey Programme) in Chile. A total sample of 2,141 people was collected, excluding those who did not answer the questions on the scale, and those who did not accept informed consent. There were no significant differences between our sample and the wider population for most socio-demographic characteristics, with the exception of educational level (see Table 8 in appendix). As is often the case with online surveys, there were some limitations in achieving the quotas for lower educational levels.

2.1 Instrument design

The proposed scale of perceptions and preferences relating to meritocracy consisted of eight indicators that were grouped into the four dimensions listed earlier: Perceptions (meritocratic/non-meritocratic) and preferences (meritocratic/non-meritocratic). In order to achieve at least some comparability with previous studies, the questions were adapted from the items battery "reasons to get ahead" (ISSP/GSS), which has been widely used for operationalizing meritocracy in previous studies (Mijs 2019; Duru-Bellat and Tenret 2012; Reynolds and Xian 2014). The aforementioned eight items, ordered according to dimensions, are presented in Table 1. These eight likert-type items have five response alternatives, ranging from "Completely disagree"(1) to "Completely agree" (5).

Table 1: Items according to dimension.

Dimension	Factor	Statement (english)	Statement (spanish)
Perception	Meritocratic	Those who try harder get greater rewards than those who work less.	Quienes más se esfuerzan logran obtener mayores recompensas que quienes se esfuerzan menos.
		Those who have more talent achieve greater rewards than those who have less talent.	Quienes poseen más talento logran obtener mayores recompensas que quienes poseen menos talento.
	Non meritocratic	Those who have rich parents succeed.	Quienes tienen padres ricos logran salir adelante.
		Those who have good contacts succeed.	Quienes tienen buenos contactos logran salir adelante.
Preference	Meritocratic	Those who try harder should get greater rewards than those who work less.	Quienes más se esfuerzan deberían obtener mayores recompensas que quienes se esfuerzan menos.
		Those who have more talent should get greater rewards than those who have less talent.	Quienes poseen más talento deberían obtener mayores recompensas que quienes poseen menos talento.
	Non meritocratic	It's fine that those with rich parents get ahead.	Está bien que quienes tienen padres ricos salgan adelante.
		It's fine that those who have good contacts get ahead.	Está bien que quienes tienen buenos contactos salgan adelante.

2.2 Administration sets

With the objective of evaluating the effect of indicator ordering, the respondents ($n = 2141$) were randomly divided into three different set-order versions, as explained in Figure 2. The scale was presented to the first group ($n = 712$) in the order that appears in Table 2. For the second group ($n = 717$), the order of the items was reorganized according to the topics of the items, e.g. for the topic of hard work, the item about perception was followed by the item about preference, and the same for the rest of the topics. Finally, for the third group ($n = 712$), the items were completely randomized.
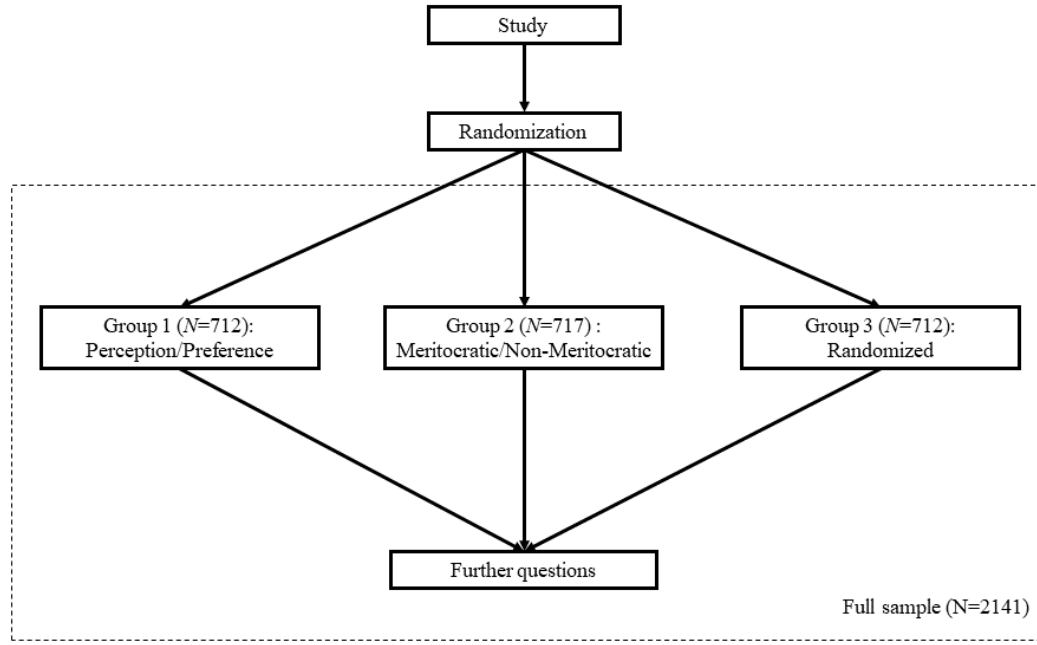
Figure 2: Survey flow

3 Methods

To test the scale's underlying constructs, we employed confirmatory factor analysis models (CFA). The models estimated one factor for each of the proposed dimensions, as represented in the following figure:
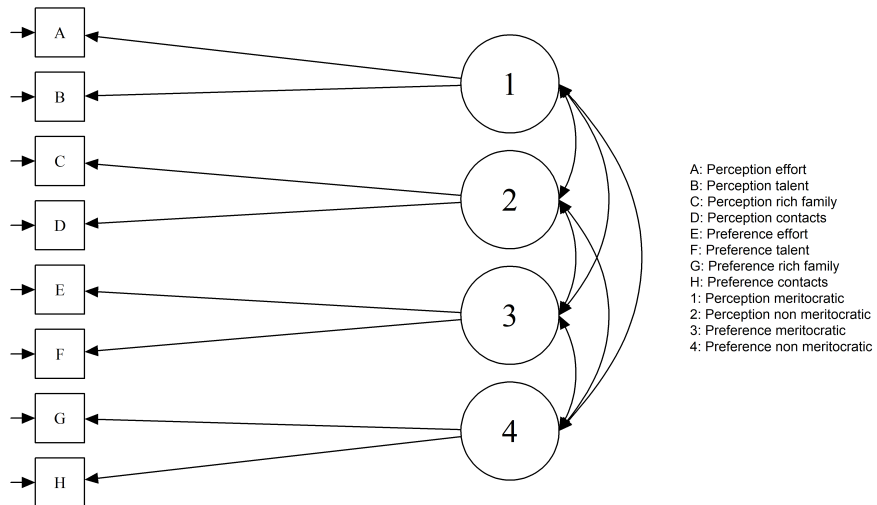

A: Perception effort
B: Perception talent
C: Perception rich family
D: Perception contacts
E: Preference effort
F: Preference talent
G: Preference rich family
H: Preference contacts
1: Perception meritocratic
2: Perception non meritocratic
3: Preference meritocratic
4: Preference non meritocratic

Figure 3: Theoretical model

CFA was conducted using the `lavaan` R package (version 0.6-3; Rosseel, 2020), with diagonally weighted least squares (DWLS) estimation due to the items' ordinal level of measurement (Kline, 2016; Rosseel, 2020). As recommended by Brown (2008), we assessed model fit by jointly considering the comparative fit index and Tucker-Lewis Index (CFI and TLI; acceptable fit > 0.95), Root of the average squared residual approximation (RMSEA; acceptable fit < 0.08), Chi-square: (p-value; acceptable fit > 0.05, and Chi-square ratio > 3).

A pre-registration was made in the OSF platform, available at the following link: https://osf.io/z45y2. Included in this pre-registration are the hypotheses regarding the four-dimensional conceptual model underlying the scale, the variable measurement levels, the statistical tests to be performed with their respective evaluation parameters, and other important aspects of the research design.

4   Results

4.1   Descriptive analyses

As can be seen in the Table 2, the indicators have values ranging from 1 (totally disagree) to 5 (totally agree). Averages are observed from 2.41, corresponding to preference-contacts; to 3.89, corresponding to preference-effort. Both indicators are consistent with a general adherence to meritocracy as reported in previous studies, privileging individual aspects such as effort (Frei et al 2020, Bucca, 2016).

Table 2: Descriptive statistics of the scale.

	Mean	SD	Min	Max
A. Perception Effort	3.20	1.38	1	5
B. Perception Talent	3.02	1.16	1	5
C. Perception rich parents	3.66	1.36	1	5
D. Perception contacts	3.79	1.24	1	5
E. Preferences Effort	3.89	1.25	1	5
F. Preferences Talent	3.24	1.19	1	5
G. Preferences rich parents	2.69	1.18	1	5
H. Preferences contacts	2.41	1.11	1	5

The graphs presented in Figure 4 display disaggregated and comparable information of the different response categories for each item. It can be seen that, in general, there is more agreement in the perception of non-meritocratic items than in meritocratic items, while in the case of preferences, the opposite occurs. As far as preferences are concerned, the preponderant role of effort over talent as a criterion of meritocratic preference is noteworthy.
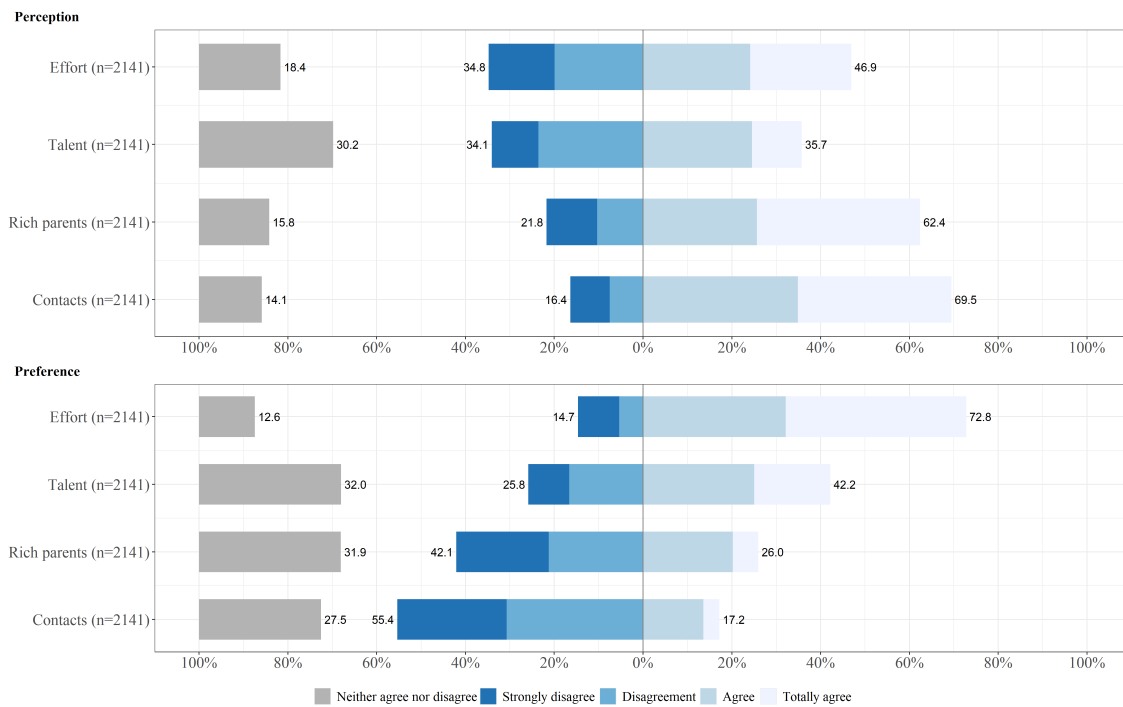
Figure 4: Descriptive plot

In Figure 5, moderate to high intensity relationships are observed between indicators that correspond to the same factor (e.g., perception of meritocracy by effort and by talent, r=0.56). The relationships between meritocratic perceptions and preferences are also noteworthy, which is not the case for non-meritocratic indicators.
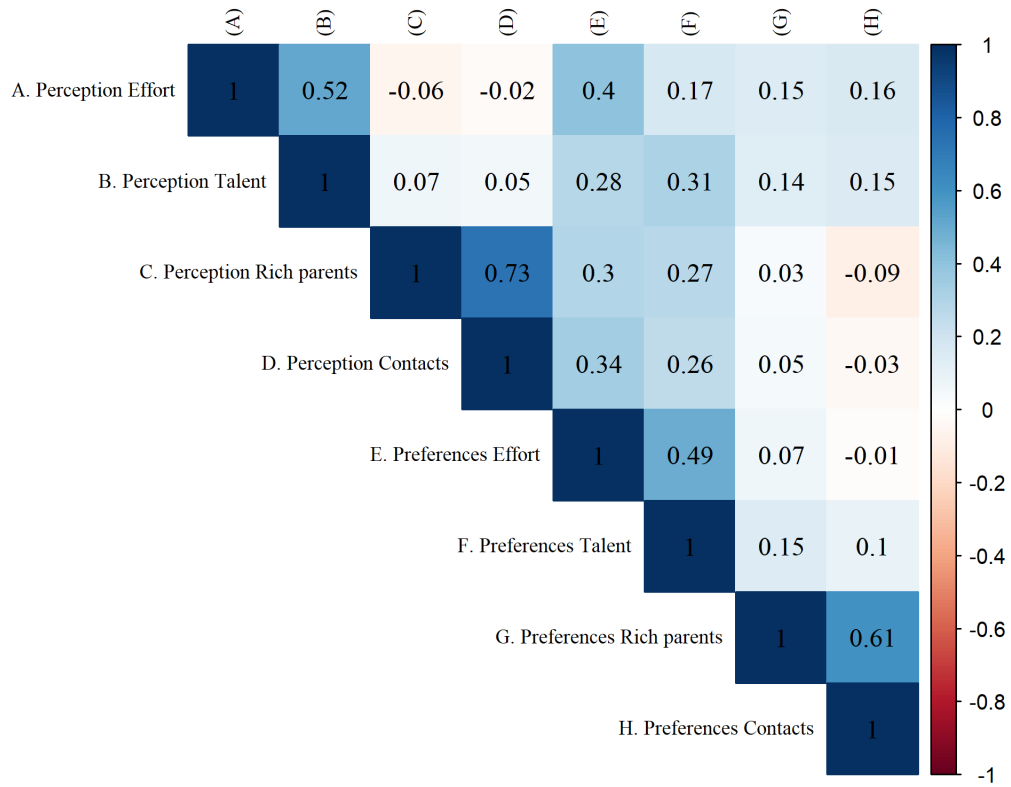
Figure 5: Polychoric correlation plot

In sum, descriptive analyses point to a relative adherence to meritocracy, which is expressed as a greater preference for meritocratic criteria, and a lesser preference for non-meritocratic criteria, even when the preference for non-meritocratic elements reaches a proportion of more than 20%. Likewise, a relatively low perception of meritocracy is observable. In addition, we observed a coherent relationship between the indicators of the same dimension as proposed in the pre-registration of the study; that is, the pairs of items associated with a specific factor show correlations with a large effect size (for example, meritocratic preferences for items associated with effort and talent). In particular, the associations between effort and talent are relevant, challenging previous assumptions that talent would not be a meritocratic criterion (Mijs 2019), otherwise the correlation would be zero or negative. In addition, we see that there is no negative correlation between meritocratic and non-meritocratic aspects, dismissing the assumptions of previous studies that these dimensions would be the opposite poles of the same continuum (Reynolds and Xian 2014).

4.2   Confirmatory Factor Analysis

This section estimates the fit of the conceptual model behind the Perceptions and Preferences for Meritocracy Scale. For this, we first estimate a confirmatory factor analysis model for the whole sample, and secondly we test the order effects applying the same model to each of the three order permutations.

4.2.1 Full sample CFA

Figure 6 shows the results of the estimation for the four-factor model using the complete sample. This model shows adequate fit indicators (CFI = 0.977, RMSEA = 0.079, $\chi2(df = 14) = 28,03$, p = 0.014) and it presents factorial loads with weights that vary between 0.63 and 0.88. Considering the correlations between the latent variables, it is observed that the variables with the strongest correlations are meritocratic perceptions and preferences, which have a positive correlation of 0.59, while non-meritocratic perceptions and preferences do not show considerable correlation.
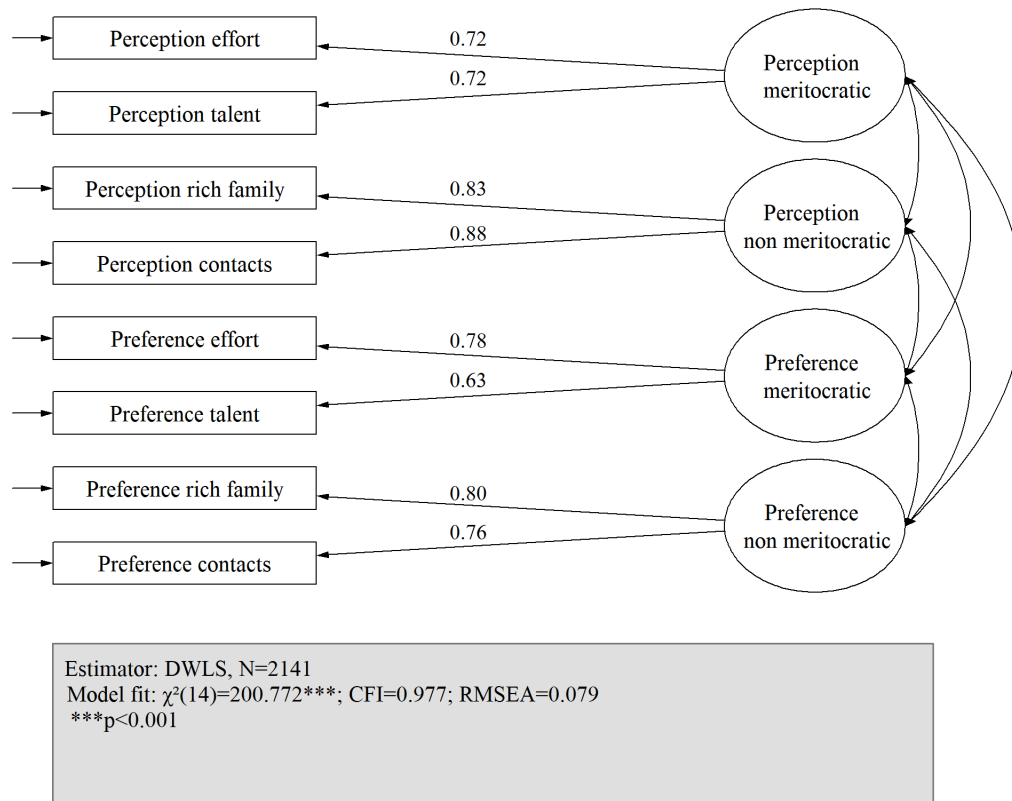

Figure 6: Confirmatory factor analysis of the Perceptions and Preferences for Meritocracy Scale

As can be seen in the Table 6, all models, regardless of the group and order of items, obtained an adequate fit, with CFI's above 0.95 and RMSEA's below 0.08. However, no model achieved a non-significant chi-square (something to be expected in large samples), although both the randomized and the first model obtained an adequate chi-square ratio of less than 3. The first order was the one that obtained the best fit (CFI=0.998, TLI=0.995, RMSEA=0.037, $\chi2(df=14)=28.03$, p = 0.014), followed by the random order of items (CFI=0.992, TLI=0.984,RMSEA=0.051, $\chi2(df=14)=39.09$, p < 0.001). On the other hand, the scale ordered by themes seems to generate a framing effect, in which the relationship between perceptions and preferences seemed to be overestimated, thus affecting the adjustment (CFI=0.984, TLI=0.968, RMSEA=.071, $\chi2(df=14)=64.156$, p < 0.001).

Table 3: Summary fit indices according group

Model	N	Estimator	χ^2	df	CFI	RMSEA
Model 1	2141	DWLS	200.772	14	0.977	0.079
Model 2	712	DWLS	42.276	14	0.993	0.053
Model 3	717	DWLS	107.573	14	0.961	0.097
Model 4	712	DWLS	63.336	14	0.979	0.070

[1] Model 1: Complete sample
[2] Model 2: fixed order by perception/preference
[3] Model 3: fixed order by topic (i.e: effort)
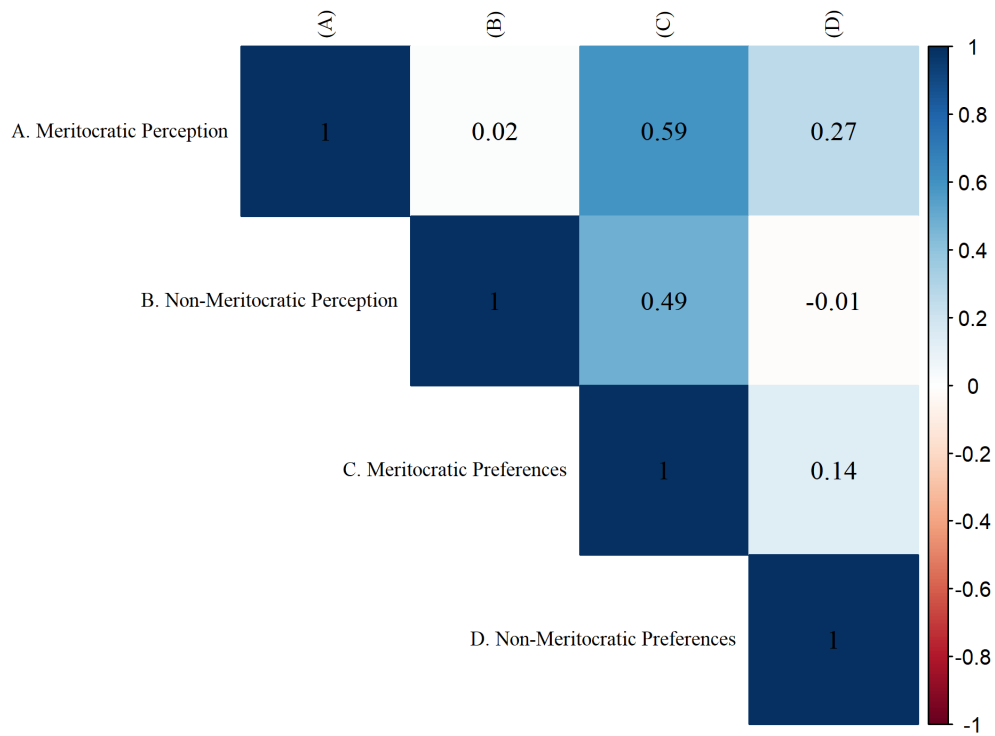[4] Model 4: Randomized order

Figure 7: Latent variables correlation

Although all tests obtained relatively adequate indicators, the aforementioned differences between the adjustments of the models according to order are statistically significant, as evaluated by an invariance analysis. It was concluded that among the three orders there was no configurational invariance, that is, they did not have the same dimensionality, and therefore did not equally fit the theoretical model (Vandenberg and Lance 2000). This is due to the effect produced by the joint appearance of items relating to the same factor in order one, which improved the fit of the model. Furthermore, in order two, when asking about perception and preference around the same indicator, cross relations increased and the model fit was worsened. Consistently, the random model presented an intermediate case between order one and order two.

Table 4: Items according to dimension..

	Contrast Model 1 Factor	theoretical model 4 Factors	Model with M.I.
n	1769	1769	1769
CFI	0.595	0.988	0.994
TLI	0.433	0.976	0.985
RMSEA	0.226	0.047	0.036
$\chi 2$	1830.839	68.661	40.250
p	.000	.000	.000
$\chi 2$**/df**	65.38	4.90	3.32

As shown in Table 4, the proposed theoretical four-factor model fits better than the one-factor contrast model. The theoretical model adjusted relatively well, as it shows preferable indicators of IFC=0.987, TLI=0.975 and RMSEA=0.041, although it also has poor indicators of $\chi 2$(df=14)=67.6 and p-value<0.001. To evaluate possible improvements in the scale, the relationships proposed by the modification indexes were analyzed. These indicate the existence of two unspecified cross-loads. When a model was generated following these recommendations, there was a considerable improvement in the model, although the new model still did not obtain a $\chi 2$ ratio of less than 3, and had very low factorial loads (τ)< 0.15. Therefore, following the recommendation of Brown (2006) to only accept the proposals of modification when theory and solid evidence are available, we decided not to incorporate these parameters into the model.

4.3 Additional validity analyses

We performed two further analyses in order to add evidence regarding the reliability and validity of the scale. Firstly we analyze the convergent validity by assessing the association of the merit scale with related concepts and correspondent measurements. Secondly, we test the internal consistency of the scale in different studies through measurement invariance methods.

4.3.1 Convergent validity

Data

For this analysis we examined information of the third wave of the study, which included additional measures that allow testing the correlations of the merit scale with some related constructs as opportunity beliefs and personal wherewithal. After listwise deletion of missing cases in socio-demographics information, a total of 1422 individuals took part in the third wave: 668 (46.97%) women and 754 (53.03%) men. The ages of 50.57% of them are 45 years or older, and 36.28% held a tertiary degree.1

Intruments

The following scales were included for testing their correlation with the the 8-item meritocracy scale:

- Opportunity beliefs: We used two items of the social inequality module of the International Social Survey Programme. Studies use generally both indicators to measure meritocratic and non-meritocratic beliefs (McCall et al., 2017; Mijs,

2019). One item measures the importance of individual factors in determining life outcomes by asking for the importance of hard work for getting ahead in life (M=3.76, SD=0.93). The second item asks for the importance of coming from a wealthy family and captures the importance of structural factors in getting ahead (M=2.75, SD=1.27). Participants responded to each item using a 1 (not at all important) to 5 (essential) response scale.

- Personal wherewithal: the questionnaire included The Neoliberal Beliefs Inventory (NBI), which consider four factors: [completar] (Bay-Cheng et al., 2015). We used the factor personal wherewithal that reflects meritocracy beliefs in terms of the importance of personal attributes as strength and skills to yield success. The construct consists of 8 items (e.g., "Any goal can be achieved with enough hard work and talent", "I've benefited from working hard, so there's no reason others can't", "Anyone who is willing to work hard can be succesful in Chile"). Participants answered the items using a 1 (totally disagree) to 6 (totally agree) scale. We simple computed mean scores [reportar alfa the cronbach], with higher scores indicating stronger support for meritocracy (M=3.32, SD=0.89, =0.89).

Both instruments cover mainly the perceptual side of the concept. Therefore, in general we expect larger correlation with meritocratic perceptions than with preferences. In the case of opportunity beliefs, the hard work item should correlate positively with meritocratic perception whereas the importance for coming from a wealthy family is expected to correlate positively with non-meritocratic perceptions. Regarding the second instrument of personal wherewithal, we also anticipate a positive correlation with meritocratic perception and low to null correlations with the other dimensions of the merit scale.

Results

We used polyserial correlations to evaluate relationships of meritocractic and non-meritocratic preferences and perceptions with the items of the opportunity beliefs battery. For personal wherewithal, we examined Pearson correlations.

Table XX about here.

Table X shows . . . [completar]. The findings provide evidence for convergent validity for meritocratic perceptions [re-escribir en el orden de los instrumentos]. As expected, we see a substantial positive correlation for the association between meritocratic perception and personal wherewithal. Finding for the association of non-meritocratic perception and non-meritocratic item of opportunity beliefs battery is also consistent with our expectation, insofar as the size of the correlation is relevant and the direction of it is positive. For the rest of correlations, we note weak correlations but most directions are consistent with our expectations. One exception is personal wherewithal, with a positive association for this construct. Correlations for meritocratic preference are also weak.

Table XX. Correlations

[insertar tabla imagen o markdown]

	Coming from a wealthy family	Hard work	Personal wherewithal
Meritocratic Perception	-0,1975	0,1877	0,3921
Unmeritocratic Perception	0,3547	-0,0775	-0,1844
Meritocratic Preferences	0,1078	0,0779	0,0819
Unmeritocratic Preferences	-0,0397	0,0824	0,2082

4.3.2 Measurement invariance

El modelamiento para el testeo invarianza ha ido tomando mayor relevancia en los estudios sociológicos de encuestas, principalmente por el interés en la validez de escalas de medición en estudios de carácter comparado en diversos contextos sociales y culturales (Davidov et al. 2014). En esta sección emplearemos un análisis de invarianza entre grupos, donde se espera que la estructura factorial propuesta sea independiente de la pertenencia a las la muestra correspondiente al estudio original y a los datos del estudio más reciente.

El procedimiento de medición de invarianza consiste en una serie de modelos anidados a los que progresivamente se le van incorporando restricciones sobre los parámetros del modelo de medición. La literatura sugiere en general que este modelamiento debe realizarse a través de cuatro niveles o tipos de restricción progresiva (Milfont and Fischer 2010; Millsap 2011; van de Schoot, Lugtig, and Hox 2012):

1. **Configural:** Se estima el Modelo solo indicando la estructura factorial utilizada en el CFA.

2. **Débil:** se aplica una restricción de igualdad a las cargas factoriales en los distintos grupos, es decir, se fuerza a que las cargas sean idénticas en ambas mediciones.

3. **Fuerte:** se suman restricciones de igualdad a los interceptos de cada indicador.

4. **Estricta:** se suman restricciones a las varianzas de error de cada indicador.

Data

Para el desarrollo de este estudio se empleó una fuente de datos distinta a la utilizada hasta ahora, consistente en una encuesta online realizada durante el primer semestre de 2020, cuyas características en términos de aplicación y cobertura son equivalentes a la del estudio anterior. La muestra final obtenida contiene 1,242 casos, donde 605 (48,71%) son mujeres y 637 (51,28%) son hombres. El 48,84% de ellos tienen 45 años o más, y el 33,97% poseen educación terciaria o superior.

En la Tabla 7 se pueden observar los resultados del ajuste de la escala en esta muestra.

Instruments

., dentro del cual se realizó una medición usando la escala a través de aleatorización completa de los indicadores, lo cual corresponde a la modalidad de aplicación del Grupo 3 presente en la Figura 2.

Results

El primer paso para el testeo de invarianza es la estimación del modelo Configural, el cual se espera que cumpla adecuadamente con los criterios de ajuste global de un modelo de medición, debido a que es el modelo base en proceso de comparación. Convencionalmente el estadístico chi-cuadrado es empleado como medida global de ajuste de un modelo de medición. Sin embargo, al ser sensible al tamaño de la muestra, se recomienda emplear tres índices de ajuste adicionales: Comparative Fit Index (CFI), el cual debe tener un valor mayor a 0.9; Root Mean Square Error Approximation (RMSEA), el cual debe estar en el rango de valores de 0.05 y 0.08; y el Standardised Root Mean Square Residuals (SRMR) que debe ser menor a 0.08 (van de Schoot, Lugtig, and Hox (2012))

La literatura sobre invarianza métrica sugiere dos aproximaciones complementarias para el testeo de invarianza. En nuestro caso, emplearemos la comparación basada en el ajuste incremental de los estadísticos de ajuste (Cheung and Rensvold 2002; Milfont and Fischer 2010; Dimitrov 2010) y el test ANOVA para comparación de medias en modelos anidados (Newsom 2015).

Table 5: Multiple Group meassurement invariance for Perceptions and Preferences for Meritocracy

Model	$\chi^2(\text{df})$	CFI	RMSEA (90 CI)	$\Delta\chi^2(\Delta\text{df})$	ΔCFI	ΔRMSEA	Decision
Configural	316.27 (28)	0.944	0.078 (0.07-0.086)				
Weak	323.62 (32)	0.943	0.073 (0.066-0.081)	7.347 (4)	-0.001	-0.005	Accept
Strong	330.66 (36)	0.942	0.07 (0.063-0.077)	7.045 (4)	-0.001	-0.004	Accept
Strict	426.74 (44)	0.925	0.072 (0.066-0.078)	96.08 (8) ***	-0.017	0.002	Reject

Note: N = 3383; Group 1, n = 1242; Group 2, n = 2141, ***p < 0.001

Table 5 shows the results of the measurement invariance tests. When attending to the traditional invariance test of $\Delta\chi^2(\Delta\text{df})$, the results support the invariance at the strong level meaning that the fit of the factor model of the PPM-S scale is equivalent across samples when constraining factor loadings and intercepts to being equal. Such results is considered in general as evidence of invariance [citar paper Fischer en SJR], as strict forms of measurement invariance rarely hold [citar van der Schoot et al]. Still, the comparability of latents means requires strict invariance which in this case does not hold using $\Delta\chi^2(\Delta\text{df})$. Nevertheless the criteria of ΔCFI used for comparing models is close to the rejection criteria of >.01, whereas the ΔRMSEA is below the cut-off criteria suggested by this criteria (citar **???**). Therefore, the evidence for strict invariance is still not concluding.

5 Conclusions

Studies that attempt to characterize and compare societies by their support for meritocratic beliefs have used differencing approaches. As most studies use secondary survey data, they tend to assume that the available indicators represent an underlying construct. A review of these studies reveals several non-tested assumptions, as well as the use of similar indicators to represent different constructs and dimensions of meritocracy. As the existence of heterogeneous approaches certainly has consequences for the advancement of the study of meritocracy, this paper presents a comprehensive conceptual framework for the empirical study of meritocracy, building upon previous research. This framework was then tested against new survey data.

We identified four critical aspects regarding the measurement of meritocracy in previous studies: unidimensionality, the ambiguous use of the term "beliefs", the use of non-meritocratic indicators as opposed to meritocratic indicators, and the consideration of measurement error. The proposed 8-item scale, "Perceptions and Preferences for Meritocracy", was designed and tested in order to deal with these four issues. Our results indicate that perceptions and preferences seem to be two related but different dimensions, often confounded in previous research under the label of "beliefs". Meritocratic and non-meritocratic dimensions do not appear to constitute poles of the same continuum, as some previous studies have assumed. Besides, we find evidence of convergent validity as well as measurement invariance that approach well the requirement of comparability between samples.

The four-dimensional framework and structure of the Perceptions and Preferences for Meritocracy scale opens several avenues for future research. For instance, distinguishing perceptions from preferences will allow us to evaluate the extent to which different societies are accustomed to, or satisfied with, the perceived level of meritocracy, in terms of differences between what is perceived and what is preferred. Additionally, given that non-meritocratic factors are not necessarily related to meritocratic ones, our framework makes it possible to assess the perceived legitimacy of practices such as the use of personal contacts and their interference (or not), within meritocratic ideals in different societies. The consideration of structural factors, both individual and societal, will allow us to advance future hypotheses relating to meritocratic legitimacy to a more comprehensive level than the one currently used, which is based solely on meritocratic perceptions. Furthermore, the impacts of different configurations of the four-dimensional framework on practices and behaviors such as corruption, civic involvement, and political alignment, is an area that requires additional research. Such future agendas could be specially relevant in times of economic crisis and growing inequalities, that could entail changes in the legitimation of the current distributive structure based on meritocratic ideals.

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A Appendix

Table 6: Factor loads and model fit.

| | Factor loadings | | | | | | | | | | | |
| | Version 1 | | | | Version 2 | | | | Version 3 | | | |
Variables	1	2	3	4	1	2	3	4	1	2	3	4
A. Who the more they try they manage to get bigger rewards that those who striveless.	0.69				0.76				0.70			
Perception Talent	0.81				0.72				0.65			
Perception rich parents		0.85				0.84				0.81		
Perception contacts		0.94				0.81				0.89		
Preferences Effort			0.85				0.82				0.66	
Preferences Talent			0.64				0.65				0.59	
Preferences rich parents				0.55				1.04				0.78
Preferences contacts				1.26				0.52				0.77
χ^2(df)		42.3(14)				107.6(14)				63.3(14)		
CFI		0.993				0.961				0.979		
RMSEA		0.053				0.097				0.070		
N		712				717				712		

Note:
Standardized factor loadings using DWLS estimator ; CFI = Comparative fit index (scaled); RMSEA = Root mean square error of approximation (scaled)

Table 7: Factor loadings and fit measures for the second sample

| | Factor loadings | | | |
Variables	1	2	3	4
A. Who the more they try they manage to get bigger rewards that those who striveless.	0.64			
B. Who possess more talent they manage to obtain greater rewards than those who possess less talent.	0.75			
C. Who they have rich parents manage to get out ahead.		0.69		
D. Who they have good contacts they manage to get out ahead.		0.80		
E. Who the more they try they should get greater rewards than those who they try less.			0.75	
F. Who possess more talent they should get greater rewards than those who possess less talent.			0.60	
G. It's fine that those who have rich parents get ahead				0.65
H. Is well that those who have good contacts get ahead.				0.77
χ^2(df)	151.9(14)			
CFI	0.942			
RMSEA	0.089			
N	1242			

Note: Standardized factor loadings using DWLS estimator ; CFI = Comparative fit index (scaled); RMSEA = Root mean square error of approximation (

Table 8: Representativeness of the sample.

	Sample	CEP
Gender		
Men	49,82%	50,52%
Women	50.18%	49,47%
Age		
18 - 24	18,55%	18,17%
25 - 34	18,86%	17,48%
35 - 44	19.09%	19,98%
45 - 54	17,96%	19,23%
55 - or more	25,54%	25.11%
Education		
Primary or less	2,93%	15,88%
High school	43,23%	37,04%
Non university	32,63%	28,93%
university or more	21,21%	18,13%