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Mapping demographic variations in sense of mastery across the world a cross-national analysis of 22 countries in the global flourishing study

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Are certain parts of the world home to people with a higher sense of mastery? Does mastery vary across key demographic factors in similar or different ways across national contexts? These questions have been underexplored, or not explored at all. We analyzed nationally representative data from 22 countries in the Global Flourishing Study (N = 202,898) and evaluated these questions. People with the highest mastery were found in countries from Latin America (e.g., #1 Mexico, #3 Argentina), the Middle East/North Africa (e.g., #2 Egypt), and in high-income societies across different regions (e.g., #4 Israel, #5 United States, #6 Spain, #7 Sweden, #8 Hong Kong, and #9 Australia). The results indicate that a high a sense of mastery is achievable in diverse geographical and cultural contexts. Meta-analytic results that pooled country-specific estimates showed a progressive increase in mastery with age. Higher mastery was reported by people who were self-employed or employed by an employer, married, highly educated, regular attendees of religious services, and men. We also observed substantial heterogeneity in these factors across countries. Our research contributes to a more nuanced understanding of global patterns of mastery, and also suggests pathways for fostering mastery within and across diverse national contexts.

Keywords Global flourishing study, Sense of mastery, Flourishing, Psychological well-being, Cross-cultural

Are there places in the world where people report higher rates of mastery—the perception that one has the ability to influence their environment and elicit desired outcomes[1,2] (henceforth referred to as either "mastery" or "sense of mastery")? Further, how does mastery vary across key demographic factors in different countries, and what insights might these differences provide? These questions have either been underexplored or not explored at all. Bridging these knowledge gaps is important because observing mastery rates across different national contexts could reveal how varying cultural practices, social support systems, economic conditions, and public policies cumulatively craft environments that foster, or impede, a sense of mastery worldwide. Further, evaluating how various demographic factors are associated with sense of mastery across different national contexts offers a unique opportunity to help us understand which of these factors might shape sense of mastery globally, and which factors might be amplified (or dampened) by the specific contexts of the countries.

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Having a strong sense of mastery is an adaptive attribute, in and of itself, because it satisfies the fundamental psychological need for competence and personal agency, core dimensions of eudaimonic well-being[3–5]. It is also valuable because it is associated with trajectories of psychological-, social-, behavioral-, and physical-well-being. Several hypothesized mechanisms help explain the salubrious effects of mastery, including associations with better health behaviors such as increased physical activity and decreased sleep problems[6,7]. Further, mastery is associated with enhanced psychological well-being, including factors like purpose in life, positive affect, optimism[6,8], and decreases in psychological distress, including factors like negative affect, depressive symptoms, and anxiety[6,8]—all factors that also translate to better outcomes. In line with this emerging evidence is work showing that mastery is associated with reduced risk of chronic conditions, such as cognitive impairment, stroke, and cardiovascular disease[6,7,9,10], as well as reduced risk of mortality[6,11]. As such, many national and international strategies to promote population health include increasing mastery as a central recommendation for action[12,13].

Sense of mastery is influenced by genetics, social-structural factors, and changing life circumstances[14,15]. However, research has shown that it is modifiable through interventions (e.g., instilling beliefs that sense of mastery is malleable, a cognitive behavioral therapy that focuses on restructuring maladaptive thoughts around mastery beliefs, increasing autonomy), as well as how and when leisure-activities or work tasks are performed[1,16,17]. One key factor hindering further intervention development is an uncertainty about the antecedents, correlates, and demographic distribution of mastery. Some literature has identified sociodemographic factors that predict higher mastery, such as: higher education[11,18–21], being in a relationship[18], employment[18,22,23], religious service attendance[21], and being male[11,18–21]. Accumulating evidence also shows that higher mastery is predicted by other potentially modifiable factors, including: social factors (e.g., higher: social participation, volunteering, social network contact, perceived support from network members; lower: loneliness)[11,18,19,23–28], psychological factors (e.g., lower: depression and negative affect)[19,23,26,29], cognitive abilities[30], and physical health factors (lower: physical dysfunction, chronic illnesses)[18,19,31].

These prior studies have made critical contributions to the research literature but remain somewhat limited in at least three ways. First, nearly all existing studies have been confined to examining predictors of mastery within single countries. Doing so limits our ability to evaluate how the sociopolitical and economic contexts of different countries might shape sense of mastery. Second, the vast majority of studies have been conducted in the United States or European countries. This narrow focus limits our understanding of how candidate predictors might interplay with sense of mastery in different cultural contexts. Third, sources of heterogeneity in demographic correlates of mastery have rarely been formally examined. Examining these sources is needed to help refine our understanding of these relationships, and why divergences in past research might exist.

In response to these identified gaps in the existing literature, our study aimed to address several of these limitations. Using data from a diverse, and international sample of 202,898 adults across 22 countries, spanning all 6 populated continents, with nationally representative sampling within each country, our study sought to answer three central questions: (1) Does mastery vary across key demographic factors (age, gender, marital status, employment status, religious service attendance, education, immigration status)? (2) Does mastery differ across cultures? (3) Do demographic differences vary across cultures? Our goal in this paper is primarily descriptive and hypothesis-generating: We chart demographic and cross-national patterns of mastery and highlight anomalies that warrant deeper theoretical testing in future work.

Methods
The description of the methods below has been adapted from[32]. Further methodological detail is available elsewhere[33–39].

Study population
We used data from the Global Flourishing Study (GFS), which examines the distribution and determinants of well-being across a sample of 202,898 participants from 22 geographically and culturally diverse countries. Wave 1 of GFS collected nationally representative data from the following countries and territories: Argentina, Australia, Brazil, Egypt, Germany, Hong Kong (Special Administrative Region of China, with mainland China also included from 2024 onwards), India, Indonesia, Israel, Japan, Kenya, Mexico, Nigeria, the Philippines, Poland, South Africa, Spain, Sweden, Tanzania, Türkiye, United Kingdom, and the United States. These countries were chosen to (1) maximize coverage of the world's population, (2) ensure geographic, cultural, and religious diversity, and (3) prioritize feasibility and existing data collection infrastructure.

Data collection was carried out by Gallup Inc. Data for Wave 1 were collected principally during 2023, with some countries beginning data collection in 2022 with exact dates varying by country[37]. Four additional waves of panel data on the participants will be collected annually from 2024 to 2027. The precise sampling design to ensure nationally representative samples varied by country and further details are available elsewhere[37]. Survey items included aspects of well-being such as happiness, health, meaning, character, relationships, and financial stability[40], along with other demographic, social, economic, political, religious, personality, childhood, community, health, and well-being variables. During the translation process, Gallup adhered to TRAPD model (translation, review, adjudication, pretesting, and documentation) for cross-cultural survey research (ccsg.isr. umich.edu/chapters/translation/overview). Further details about methodology and survey development are documented in the GFS Questionnaire Development Report[33], GFS Methodology[37], GFS Codebook, and GFS Translations documents[34]. Ethical approval was granted by the institutional review boards at Baylor University and Gallup, and all participants provided informed consent.

Measures

Sense of Mastery Sense of mastery was assessed by asking "How often do you feel very capable in most things you do in life?" Response options included: Always, often, rarely, never. In our main analyses, mastery was dichotomized as 1 (always/often) versus 0 (rarely/never)–as described in our pre-registered analyses. We initially chose this cut-off because it reflects a conceptual distinction where individuals who consistently feel capable ("always/often") are separated from those who have a pronounced deficit ("rarely/never").

Demographic variables (1) Continuous age was classified as 18–24, 25–29, 30–39, 40–49, 50–59, 60–69, 70–79, and 80 or older, (2) Gender was assessed as male, female, or other, (3) Marital status was assessed as single/never married, married, separated, divorced, widowed, and domestic partner, (4) Employment was assessed as employed for an employer, self-employed, retired, student, homemaker, unemployed and searching, and other, (5) Education was assessed as up to 8 years, 9–15 years, and 16 + years, (6) Religious service attendance was assessed as more than once/week, once/week, one-to-three times/month, a few times/year, or never, (7) Immigration status was dichotomously assessed with: "Were you born in this country, or not?," (8) Religious tradition/affiliation with categories of Christianity, Islam, Hinduism, Buddhism, Judaism, Sikhism, Baha'i, Jainism, Shinto, Taoism, Confucianism, Primal/Animist/Folk religion, Spiritism, African-Derived, some other religion, or no religion/atheist/agnostic; precise response categories varied by country[34], (9) Racial/ethnic identity was assessed in some, but not all, countries, with response categories varying by country. For additional details on the assessments see the GFS codebook[33].

Statistical analysis

Descriptive statistics for the full sample, weighted to be nationally representative within each country, were estimated for each of the demographic variables. Nationally representative proportions for sense of mastery were estimated separately for each country and ordered from highest to lowest along with 95% confidence intervals. Variation in proportions for dichotomized sense of mastery across demographic categories were estimated, with all analyses initially conducted by country (online supplement). Primary results consisted of random effects meta-analyses of country-specific proportions of sense of mastery for each specific demographic category[41,42] along with 95% confidence intervals, standard errors, upper and lower limits of a 95% prediction interval across countries, heterogeneity (τ), and I^2 for evidence concerning variation within a particular demographic variable across countries[43]. Forest plots of estimates are available in the online supplement. All meta-analyses were conducted in **R** (R Core Team, 2024) using the metafor package[44]. Within each country, a global test of variation of sense of mastery across categories of each particular demographic variable was conducted, and a pooled p value[45] across countries was also reported concerning evidence for variation within any country. Bonferroni corrected p value thresholds are provided based on the number of demographic variables[46,47]. We estimated country-specific proportions in sense of mastery by religious affiliation/tradition and race/ethnicity, whenever the variables were available with results reported in our online supplement, but these variables were not included in the meta-analyses because the observed response categories varied by country. As a supplementary analysis, population weighted meta-analyses were also conducted.

Missing data

Missing data on all variables was imputed using multivariate imputation by chained equations, and five imputed datasets were used[48–50]. To account for variation in the assessment of certain variables across countries (e.g., religious affiliation/tradition and race/ethnicity), the imputation process was conducted separately in each country. This within-country imputation approach ensured that the imputation models accurately reflected country-specific contexts and assessment methods. Sampling weights were included in the imputation models to account for specific-variable missingness that may have been related to probability of inclusion in the study.

Accounting for complex sampling design

The GFS used different sampling schemes across countries based on availability of existing panels and recruitment needs[37]. All analyses accounted for the complex survey design components by including weights, primary sampling units, and strata. Additional methodological detail, including accounting for the complex sampling design, is provided elsewhere[38,51].

Additional exploratory analyses (not pre-registered)

We also conducted exploratory post-hoc analyses to consider what influence using a different dichotomization point for mastery might have on our results. For this analysis, we analyzed mastery with an alternate dichotomization point (1 (always) vs. 0 (often/rarely/never)), as opposed to our original dichotomization point ((1 (always/often) vs. 0 (rarely/never)).

Results

Descriptive statistics

Table 1 provides the descriptive statistics. Participant ages ranged the entire adult lifespan (18–80 +). The gender distribution was nearly balanced with 51% female, 49% male, along with a small representation from other gender identities (< 1%). Most participants were: married (53%), attained 9–15 years of education (57%), native-born (94%), and employed for an employer (39%). Regular attendance at religious services varied, with most never attending (37%), some attending once a week (19%), and others attending more than once a week (13%).

Rates of mastery across 22 countries

Table 2 presents the rates of mastery, cultural region, and World Bank country classification by income for each of the 22 countries. Countries from Latin America, the Middle East/North Africa, and high-income countries

Participant characteristics	No. (%)
Age	
18–24	27,007 (13%)
25–29	20,700 (10%)
30–39	40,256 (20%)
40–49	34,464 (17%)
50–59	31,793 (16%)
60–69	27,763 (14%)
70–79	16,776 (8%)
80 or older	4119 (2%)
Missing	20 (<0.1%)
Gender	
Male	98,411 (49%)
Female	103,488 (51%)
Other	602 (0.3%)
Missing	397 (0.2%)
Marital status	
Single/Never been married	52,115 (26%)
Married	107,354 (53%)
Separated	5195 (3%)
Divorced	11,654 (6%)
Widowed	9823 (5%)
Domestic partner	14,931 (7%)
Missing	1826 (1%)
Employment	
Employed for an employer	78,815 (39%)
Self-employed	36,362 (18%)
Retired	29,303 (14%)
Student	10,726 (5%)
Homemaker	21,677 (11%)
Unemployed and looking for a job	16,790 (8%)
None of these/other	8431 (4%)
Missing	793 (<0.1%)
Education	
Up to 8 years	45,078 (22%)
9–15 years	115,096 (57%)
16 + years	42,578 (21%)
Missing	146 (<0.1%)
Religious service attendance	
>1x/week	26,537 (13%)
1x/week	39,157 (19%)
1-3x/month	19,749 (10%)
A few times a year	41,436 (20%)
Never	75,297 (37%)
Missing	722 (0.4%)
Immigration	
Born in this country	190,998 (94%)
Born in another country	9791 (5%)
Missing	2110 (1%)
Country	
Argentina	6724 (3%)
Australia	3844 (2%)
Brazil	13,204 (7%)
Egypt	4729 (2%)
Germany	9506 (5%)
Hong Kong	3012 (1%)
India	12,765 (6%)
Continued	

Participant characteristics	No. (%)
Indonesia	6992 (3%)
Israel	3669 (2%)
Japan	20,543 (10%)
Kenya	11,389 (6%)
Mexico	5776 (3%)
Nigeria	6827 (3%)
Philippines	5292 (3%)
Poland	10,389 (5%)
South Africa	2651 (1%)
Spain	6290 (3%)
Sweden	15,068 (7%)
Tanzania	9075 (4%)
Turkey	1473 (1%)
United Kingdom	5368 (3%)
United States	38,312 (19%)

Table 1. Nationally-representative descriptive statistics of the observed sample (N = 202,898). *Country-specific descriptive statistics are available in the Online Supplement.

Country	%	95% CI	SD	Cultural region	World Bank country classification by income*
Mexico	0.90	0.89, 0.91	0.30	Latin America	Upper middle income
Egypt	0.90	0.88, 0.91	0.31	Middle East/N. Africa	Lower middle income
Argentina	0.88	0.87, 0.89	0.32	Latin America	Upper middle income
Israel	0.87	0.85, 0.89	0.34	Middle East	High income
United States	0.86	0.85, 0.87	0.34	North America	High income
Spain	0.86	0.85, 0.87	0.35	Western Europe	High income
Sweden	0.86	0.85, 0.86	0.35	Northern Europe	High income
Hong Kong	0.86	0.84, 0.88	0.35	East Asia	High income
Australia	0.86	0.84, 0.87	0.35	Oceania	High income
South Africa	0.84	0.83, 0.86	0.36	Sub-Saharan Africa	Upper middle income
Germany	0.84	0.83, 0.85	0.37	Western Europe	High income
Poland	0.84	0.82, 0.86	0.37	Eastern Europe	High income
Brazil	0.81	0.80, 0.82	0.39	Latin America	Lower middle income
Nigeria	0.81	0.79, 0.82	0.39	Sub-Saharan Africa	Lower middle income
United Kingdom	0.80	0.79, 0.82	0.40	Western Europe	High income
Indonesia	0.78	0.76, 0.79	0.42	Southeast Asia	Upper middle income
Turkey	0.74	0.71, 0.76	0.44	Middle East	Upper middle income
India	0.70	0.69, 0.71	0.46	South Asia	Lower middle income
Kenya	0.69	0.68, 0.71	0.46	Sub-Saharan Africa	Lower middle income
Tanzania	0.66	0.64, 0.67	0.47	Sub-Saharan Africa	Lower middle income
Philippines	0.63	0.61, 0.64	0.48	Southeast Asia	Lower middle income
Japan	0.39	0.38, 0.40	0.49	East Asia	High income

Table 2. Proportion of population reporting sense of mastery by country. *https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html. **https://hdr.undp.org/sites/default/files/2023-24_HDR/HDR23-24_Statistical_Annex_HDI_Table.xlsx/).

across different regions featured prominently among those reporting the highest rates of mastery. Specific examples include countries from Latin America (e.g., #1 Mexico, Proportion: 90%; #3 Argentina, 88%), the Middle East/North Africa (e.g., #2 Egypt, 90%), and high-income countries across different regions (e.g., #4 Israel, 87%; #5 United States, 86%; #6 Spain, 86%; #7 Sweden, 86%; #8 Hong Kong, 86%; #9 Australia, 86%). Additionally, the countries with the lowest rates of mastery were predominantly countries considered more collectivistic (e.g., #22 Japan: 39%; #21 Philippines: 63%; #20 Tanzania: 66%; #19 Kenya 69%).

Variable	Category	Proportion	95% CI of Proportion	SE analogue (CI Width/4)	LL	UL	Heterogeneity (τ)	I^2	Global p value
Age group	18–24	0.77	(0.72,0.81)	0.02	0.40	0.91	0.10	92.6	<0.001**
	25–29	0.78	(0.73,0.82)	0.02	0.35	0.91	0.11	93.3	
	30–39	0.80	(0.75,0.84)	0.02	0.35	0.90	0.10	93.5	
	40–49	0.80	(0.75,0.84)	0.02	0.36	0.92	0.11	94.5	
	50–59	0.82	(0.76,0.86)	0.03	0.37	0.94	0.12	95.5	
	60–69	0.82	(0.76,0.87)	0.03	0.42	0.93	0.12	95.8	
	70–79	0.82	(0.76,0.86)	0.03	0.48	0.95	0.13	95.9	
	80 or older	0.87	(0.74,0.94)	0.05	0.43	1.00	0.24	99.3	
Gender	Male	0.82	(0.77,0.86)	0.02	0.40	0.91	0.10	93.2	<0.001**
	Female	0.79	(0.75,0.83)	0.02	0.41	0.89	0.10	92.7	
	Other	0.45	(0.07,0.90)	0.21	0.00	1.00	1.38	99.9	
Marital status	Married	0.83	(0.78,0.87)	0.02	0.43	0.93	0.11	94.8	<0.001**
	Separated	0.77	(0.72,0.82)	0.02	0.44	0.92	0.11	93.9	
	Divorced	0.79	(0.73,0.84)	0.03	0.38	0.92	0.13	95.2	
	Widowed	0.79	(0.73,0.84)	0.03	0.46	0.91	0.12	94.8	
	Domestic partner	0.65	(0.38,0.85)	0.12	0.00	0.91	0.61	99.6	
	Single, never married	0.78	(0.73,0.82)	0.02	0.32	0.89	0.10	92.7	
Employment status	Employed for an employer	0.83	(0.78,0.86)	0.02	0.40	0.91	0.09	92.7	<0.001**
	Self-employed	0.83	(0.78,0.87)	0.02	0.45	0.93	0.10	94.4	
	Retired	0.82	(0.77,0.86)	0.02	0.45	0.92	0.11	94.9	
	Student	0.79	(0.74,0.83)	0.02	0.45	0.92	0.10	92.7	
	Homemaker	0.76	(0.72,0.81)	0.02	0.41	0.89	0.10	92.4	
	Unemployed and looking for a job	0.73	(0.66,0.78)	0.03	0.22	0.89	0.14	94.9	
	None of these/other	0.72	(0.65,0.78)	0.03	0.37	0.93	0.15	95.8	
Education	Up to 8 years	0.77	(0.70,0.82)	0.03	0.28	0.95	0.14	95.7	<0.001**
	9–15 years	0.81	(0.76,0.84)	0.02	0.37	0.91	0.09	92.3	
	16+ years	0.87	(0.84,0.90)	0.02	0.50	0.95	0.07	91.8	
Religious service attendance	>1x/week	0.85	(0.81,0.89)	0.02	0.62	0.98	0.10	95.3	<0.001**
	1x/week	0.84	(0.80,0.87)	0.02	0.65	0.92	0.08	92.1	
	1–3x/month	0.79	(0.75,0.83)	0.02	0.50	0.90	0.10	92.4	
	A few times a year	0.80	(0.75,0.85)	0.02	0.44	0.91	0.11	94.0	
	Never	0.76	(0.71,0.81)	0.03	0.38	0.89	0.12	94.1	
Immigration status	Born in this country	0.80	(0.76,0.84)	0.02	0.40	0.90	0.10	93.0	<0.001**
	Born in another country	0.81	(0.76,0.85)	0.02	0.43	0.93	0.10	93.6	

Table 3. Random effects meta-analysis of proportion of population reporting sense of mastery by demographic category. *p < .05; **p < .007 (Bonferroni corrected threshold) CI, confidence interval; SE, standard error. τ is the standard deviation of the distribution of proportions across countries/territories, an indicator of cross-national heterogeneity. I^2 is an estimate of the variability in proportions due to heterogeneity across countries/territories vs. sampling variability. Global p value corresponds to a test of the null hypothesis that there are no differences between the groups for that sociodemographic characteristic in any of the 22 countries.

Demographic correlates and cross-national variations in sense of mastery

Our meta-analytic results showed substantial variation in the experience of mastery across different demographic categories (Table 3). There was notable variation across countries as indicated by the heterogeneity statistics (τ and I^2). We comment on both the overall patterns for each demographic category and variations across countries. The Appendix provides detailed comparisons of mastery within countries (Supplementary Tables S2a–23b and Figures S1–S115).

There was a progressive increase in mastery with age in several countries (i.e., Australia, Brazil, Germany, Japan, Mexico, South Africa, United Kingdom, United States). For instance, on average across countries the percentage of people reporting always/often feeling a sense of mastery increased from 77% (95% CI 72%, 81%) for the 18–24 age group to 87% (95% CI 74%, 94%) for those aged 80 or older. Some countries, however, showed an increase in mastery with age, and then a decline at the oldest ages (i.e., Argentina, Egypt, Israel, Philippines, Spain, Sweden). In contrast, mastery remained relatively stable with a decline at the oldest ages in other countries (i.e., Hong Kong, India, Indonesia). Further, some countries exhibited an overall decline in mastery with age

(i.e., Kenya, Nigeria, Poland, and Tanzania). Finally, one country exhibited an increase, followed by a decrease, in mastery at older ages (i.e., Turkey).

Mastery levels were similar between men and women, though slightly higher among men, with 82% (95% CI 77–86%, SE 0.02) of men and 79% (95% CI 75–83%, SE 0.02) of women reporting a sense of mastery. Most countries exhibited a slightly higher mastery score among men compared to women (i.e., Argentina, Australia, Brazil, Germany, Hong Kong, India, Indonesia, Israel, Kenya, Mexico, Nigeria, Philippines, South Africa, Sweden, Tanzania, United Kingdom, United States). In contrast, women reported higher mastery in some other countries (i.e., Egypt, Japan, Turkey). Meanwhile, other countries reported equivalent mastery rates (i.e., Poland and Spain). Additionally, people identifying as non-binary reported substantially lower mastery at 45% (95% CI 7–90%). However, this estimate should be interpreted with caution due to the small number of non-binary respondents (0.3%) in the sample and thus substantial statistical uncertainty in the estimate.

In terms of marital status, married people reported the highest mastery (83%, 95% CI 78–87%, SE: 0.02), followed by single people (i.e., divorced, widowed, never married, separated; 77–79%, SE: 0.02–0.03) and those in domestic partnerships (65%, 95% CI 38–85%, SE 0.12). In most countries married people reported the highest mastery (i.e., Argentina, Australia, Brazil, Germany, Hong Kong, Mexico, South Africa, Sweden, United Kingdom, United States). However, other countries displayed unique patterns. For example, separated individuals reported the highest mastery in Egypt, Poland, and Turkey, whereas domestic partners showed the highest mastery in Indonesia, Kenya, and Spain. In countries like Tanzania, single individuals reported higher mastery than those who were married, while people in Spain and Egypt reported higher mastery among widowed, separated, or divorced individuals, sometimes surpassing those who were married. These differences in mastery across marital statuses were, however, relatively minor.

Employment status was associated with mastery. Those employed by an employer or self-employed reported the highest rates of mastery (83%, 95% CI 78–86%/87%, SE: 0.02), followed closely by retirees (82%, 95% CI 77–86%, SE: 0.02). Students (79%, 95% CI 74–83%, SE: 0.02) and homemakers (76%, 95% CI 72–81%, SE: 0.02) had somewhat lower but still high mastery, while unemployed people (73%, 95% CI 66%–78%, SE: 0.03) and those reporting none of these/other roles (72%, 95% CI 65–78%, SE: 0.03) reported the lowest mastery. Many countries followed this general pattern (i.e., Argentina, Australia, Brazil, Germany, Hong Kong, Mexico, Spain, Sweden, United Kingdom, United States). However, in some countries, retirees reported the highest mastery (i.e., Egypt, India, Indonesia, Japan); Egypt and Indonesia also reported minimal variation across employment types. In other countries, students reported the highest mastery (i.e., Israel, Kenya, Poland, Tanzania). People in other countries reported generally low mastery rates across all employment types (e.g., Japan, Philippines). Still other countries displayed unique patterns (i.e., South Africa, Turkey).

Higher education was linked with higher mastery in a dose–response manner, with people having 16 + years of education reporting the highest mastery rates (87%, 95% CI 84–90%, SE: 0.02). However, we observed interesting variations in three countries that all showed a U-shaped curve (i.e., Australia, South Africa, United States). For example, in Australia, mastery was U-shaped with education and dropped from 95% (95% CI 92–98%) for those with up to 8 years of education to 84% (95% CI 76–89%) for those with 9–15 years, before rising to 88% (95% CI 81–93%) for those with 16 + years of education.

Rates of mastery were similar between people born in another country and those born in the given country, with 81% (95% CI 76–85%) and 80% (95% CI 76–84%) reporting mastery, respectively. In most countries, native-born individuals reported higher mastery (i.e., Argentina, Egypt, Germany, Hong Kong, India, Indonesia, Israel, Kenya, Mexico, Poland, South Africa, Turkey). However, in other countries, foreign-born individuals reported higher mastery (i.e., Australia, Brazil, Japan, Nigeria, Philippines, Spain, Tanzania, United Kingdom). Lastly, two countries reported identical mastery rates between native and foreign-born groups (i.e., Sweden, United States).

Regular participation in religious services was closely associated with heightened mastery. There was a clear gradient based on frequency of involvement (More than once/week 85%, 95% CI 81–89%, SE: 0.02 v. Never 76%, 95% CI 71–81%, SE = 0.03). Many countries showed a clear gradient, where progressively higher levels of religious service attendance were associated with higher rates of mastery (i.e., Argentina, Brazil, Hong Kong, Japan, Indonesia, India, Kenya, South Africa, Tanzania, United Kingdom, United States). Some countries exhibited relatively high mastery rates across all levels of service attendance (i.e., Egypt, Mexico). While other countries displayed relatively lower mastery rates across all levels of service attendance (i.e., Philippines, Tanzania), and some showed relatively minimal variation across levels of service attendance (i.e., Nigeria, Turkey). Finally, some countries exhibited high levels of mastery even among occasional service attendees (i.e., Poland, Spain).

Table S1 complements the results from Table 3 by providing a population weighted meta-analysis, where each country's results are weighted according to its actual 2023 population size. Results across the two tables were very similar, though India is given much higher weight in the supplement given its large population size.

Post-hoc analyses

To assess the influence of an alternate dichotomization point on mastery, we conducted post-hoc analyses comparing our original dichotomization cut point (1 = always/often vs. 0 = rarely/never) with an alternate cut point (1 = always vs. 0 = often/rarely/never). Results from the analyses are presented in Table S24. Compared to the original results in Table 2, the alternate dichotomization resulted in a reordering of the countries. Specifically, 9 out of the 10 high-income countries were now ranked at the bottom, indicating a substantial shift in country rankings when mastery was defined more stringently.

Discussion
Global patterns in sense of mastery across the world

Leveraging nationally representative data from 22 countries, we observed that countries from Latin America (e.g., #1 Mexico, #3 Argentina), the Middle East/North Africa (e.g., #2 Egypt), and high-income societies across

different regions (e.g., #4 Israel, #5 United States, #6 Spain, #7 Sweden, #8 Hong Kong, and #9 Australia) featured prominently among those with the highest rates of mastery. This suggests high mastery is achievable in diverse geographical and cultural contexts.

Demographic correlates of mastery: results in the context of past research

Many of our findings align with prior studies that identified correlates of increased mastery, including: higher education[11,18–21], being in a relationship[18], employment[18,22], religious service attendance[21], and being male[11,18–21]—but this latter difference is often small or nearly non-existent[22], as observed in our study. Our findings are consistent with previous research indicating that mastery generally increases from young adulthood to midlife[18,20–22]. However, our results also displayed some differences regarding age-related differences in mastery. While many studies suggest that mastery tends to decline after midlife[18,21], there is some evidence that the oldest individuals might actually experience higher mastery into old age[20]. Our meta-analytic results support this latter observation, showing a small but steady increase in mastery with age throughout the lifespan in most countries. An important caveat is that, due to the cross-sectional nature of the data, we are unable to distinguish whether these associations arise from age effects or cohort effects. However, this question can be addressed with future waves of longitudinal GFS data. Additionally, this finding of increased mastery with increasing age could also be attributable to a methodological effect where those with higher mastery have reduced risk of mortality[6], and thus this finding might be attributable to survival bias.

Several reasons might explain the discrepancies between our results and those from prior studies, including differences in: (1) analytic techniques (e.g., we focused on unadjusted demographic correlates to provide purely descriptive statistics, while prior studies typically used covariate-adjusted models, and still others examined changes in predictors over time)[52], (2) measurement and categorization of mastery (e.g., 1-item measure vs. multi-item measures), and correlates (e.g., education was coded categorically vs. continuously), (3) aspects of sample composition (e.g., nationally representative vs. select groups or healthy people vs. patient samples with specific conditions), and (4) geographic diversity (e.g., previous studies focused primarily on high-income countries, but our study incorporated a broader range of countries, potentially leading to different findings). Some discrepancies in findings may arise due to diverse methods used in existing research, highlighting the need for continued research that will refine our understanding of these relationships.

Demographic correlates of mastery: a social cognitive perspective

Overall, meta-analytic results that pooled country-specific estimates highlight how environments rich in resources and opportunities (e.g., highly educated, self-employed or employed by an employer), as well as support (e.g., married, regular attendees of religious services) are associated with higher mastery. This pattern of results might be understood through a broader application of Bandura's social cognitive theory[2], which suggests that a person's sense of control involves beliefs about personal mastery (i.e., self-efficacy) and perceived constraints (i.e., outcome expectations) and is influenced in part by (1) firsthand experiences of mastery as well as (2) feedback from interactions with others. Although our findings are based on observational data, which limits our ability to make causal conclusions, we offer the following interpretations as potential explanations for the associations we observed. These interpretations propose hypothetical pathways that may help explain the relationship between demographic factors and sense of mastery, rather than asserting any definitive causal conclusions.

Some of our findings indicating that (1) highly educated and (2) self-employed or employed people have a higher sense of mastery can be contextualized through the lens of (a) *firsthand experiences of mastery*. *Firsthand experiences of mastery* are direct experiences that people use to assess their abilities, enhancing their sense of mastery when these experiences are perceived as successful. Education is associated with knowledge, critical thinking skills, and problem-solving abilities. These skills, may in turn, be associated with greater confidence in managing various aspects of life. Employment may provide opportunities for individuals to make decisions, set goals, and observe tangible results of from efforts. Adults with higher levels of education and stable employment tend to engage in complex tasks, face challenges, and may experience successes that contribute to increased belief in their capabilities. These successful experiences may accumulate over time, potentially fostering psychological resilience, expanding behavioral repertoires, and contribute to a broad catalog of mastery experiences that can support a strong sense of mastery. Conversely, adults with lower levels of education and unstable employment may face substantial hurdles in building a strong sense of mastery. Limited access to educational and vocational opportunities may limit their ability to engage in mastery-enhancing experiences. Additionally, individuals in lower socioeconomic positions often grapple with a lack of resources—such as financial instability, limited social networks, and reduced autonomy—which leads to chronic stress [12]. They are also more likely to be exposed to adverse environments, including substandard housing, polluted neighborhoods, food deserts, and higher crime rates. These stressors are associated with increased mental health issues and physical health ailments over the life course. And these adverse health outcomes may further reduce opportunities to engage in mastery experiences throughout life.

Some of our other findings, such as the association between higher mastery with both (1) marriage and (2) regular attendance at religious services may be understood through Bandura's concept of (b) *feedback from interactions with others*. Bandura theorized that people can develop mastery not only through direct experiences, but also by observing others successfully navigate similar tasks. In the context of marriage, particularly in positive partnerships, spouses may provide support by sharing experiences, offering encouragement, and demonstrating effective coping strategies that a partner can emulate[53]. This mutual support may help married individuals to tackle life's challenges together, and could contribute to a stronger sense of mastery. A supportive spouse may serve as a consistent source of positive feedback, which could enhance self-efficacy by reinforcing one's belief in their capabilities. Similarly, regular attendance at religious services may connect individuals to a community

that provides social support, shared values, and opportunities for meaningful participation[54]. In these settings, individuals might observe others overcoming adversity and displaying resilience, which may provide them with vicarious experiences of mastery. Additionally, many religious teachings emphasize themes of personal agency, hope, and empowerment, which might positively influence outcome expectations and perceived constraints[54].

Post-hoc analyses

To assess the influence of an alternate dichotomization point on mastery, we conducted post-hoc analyses comparing our original dichotomization cut point (1 = *always/often* vs. 0 = rarely/never) with an alternate cut point (1 = *always* vs. 0 = *often/rarely/never*). Compared to the original results in Table 2, the alternate dichotomization resulted in a reordering of the countries. We observed that 9 out of the 10 high-income countries were now ranked at the bottom. Upon closer examination, we observed that this pattern was driven almost entirely by cross-cultural response-style differences. Specifically, how willing respondents were to endorse the most-extreme category. In high-income countries, only about 10–35% of respondents who reported mastery choose *always*; the majority selected the slightly milder *often* option. However, among people in lower-/middle-income countries, a much larger share, about 40–80%—selected *always*. Another factor may also play a role here. Even individuals who generally view themselves as having high mastery may recognize that their abilities vary by context—for example, "I'm confident at work but still learning how to manage my finances." Those respondents may therefore choose *often* rather than the absolute *always*. Because Table S24 scores *only always* as 1, countries whose cultural norms favor extreme positive responses moved to the top, while those whose respondents preferred a more moderate descriptor shifted to the bottom. When *always* and *often* were combined (Table 2), the impact of this response-style variance was dampened, yielding the rank order we preregistered. We believe the preregistered cut-point (*always* + *often* = 1) is less sensitive to extreme-response biases and therefore provides a more cross-nationally comparable estimate of mastery. Future research using multi-item mastery scales and item-response–theory approaches could further adjust for response-style variation.

Limitations and strengths

This study had several limitations. First, assessments were conducted in different countries at various times of the year, and in some cases, even different years. This variation could introduce seasonality effects and shifts in mastery due to evolving conditions over time. Second, this was a descriptive cross-sectional study that used univariate analyses; thus, we cannot infer causality. Third, the mastery rates were limited to the 22 countries within the dataset, and the demographic correlates were limited to the available data. Future research should consider a broader range of countries and demographic correlates. Fourth, caution is needed in interpreting cross-national differences as these may be influenced by matters of translation, different modes of assessment, differing interpretation of items and also of response scales. However, analyses from cognitive interviews suggest that this was not as severe a problem for mastery in the Global Flourishing Study[30]. Fifth, the quantitative focus of the current study provides broad insights but can lack the depth that qualitative methods offer. Integrating qualitative studies exploring personal narratives of mastery within different cultural contexts could enrich the understanding of how individual experiences and cultural narratives intersect to shape one's sense of mastery. Sixth, our primary unit of analysis was the nation, so this approach might not fully consider cultural diversity within nations. For instance, Sweden is small, culturally homogenous, and has been relatively self-governing since the eleventh century. In contrast, Indonesia encompasses over 300 distinct languages and has been influenced by Buddhism, Hinduism, Islam, Christianity, and Confucianism[55]. Seventh, because mastery was assessed with a single, positively worded item, our estimates remain susceptible to cross-cultural response styles—notably acquiescence, extreme responding, and modesty bias[56]. This positive phrasing, however, is not unusual: widely used mastery and self-efficacy instruments (e.g., the General Self-Efficacy Scale) also focus on what respondents *can* do rather than what they *cannot*, so our item is aligned with standard measurement practice. Our preregistered dichotomisation (*always* + *often* = 1) and the post-hoc sensitivity test using the stricter cut-point (*always* = 1) show that much of the between-country volatility stems from how willing respondents are to endorse the most-extreme category. For example, only ~3% of Japanese respondents choose *always*, consistent with a cultural norm of modesty, whereas as many as ~40–50% of respondents in in Latin-American nations selected that extreme option—an illustration of acquiescent/extreme response tendencies. Collapsing *always* and *often* therefore dampened, but did not eliminate, this bias. Because a single item precludes formal modelling of acquiescence, future studies should adopt a multi-item mastery battery that mixes positively and negatively framed statements (e.g., "I often feel incapable") and apply item-response-theory approaches to derive a more precise, cross-culturally comparable index of perceived control. Eighth, mastery was originally measured on a four-point Likert scale *(1 = never to 4 = always)*. Although ordinal-regression models can capture the full response range, their outputs are less intuitive for non-technical audiences. To facilitate clear interpretation and to align with the pre-registered analytic protocol used across the Global Flourishing Study collection, we dichotomized the item *(always/often = 1, rarely/never = 0)*. This protocol, approved by the journal's Editor-in-Chief, balances statistical rigor with accessibility but inevitably compresses information; future work could model the ordinal structure directly to examine finer-grained differences. Nineth, although these nations span every inhabited continent and a wide spectrum of cultural and economic settings, they still capture only a portion of global diversity. Thus, patterns reported here should be interpreted as conditional on this list of countries. Future studies that include additional regions, particularly those under-represented in the this sample, will be needed to confirm how broadly these patterns apply.

This study also had notable strengths. It is one of the few that has evaluated demographic correlates of mastery cross-nationally. Further, we used large, diverse, and nationally representative samples from 22 countries with extensive geographic coverage. This coverage expands beyond the Western, Educated, Industrialized, Rich, and Democratic (WEIRD) samples that are typically evaluated in psychological research[57], and studies evaluating

mastery. We also were able to use well-thought-out questionnaires specifically designed for the study of well-being, rather than relying on suboptimal items that were repurposed from existing studies.

Further, there are many additional follow-up questions that this study generated, which we hope future researchers will further investigate, including, but not limited to the following:

(1) Why do the countries with the lowest mean mastery scores in our sample tend to be those commonly characterised as more collectivistic? (2) What factors underlie the observed decline in mastery across the adult life span in specific nations such as Kenya, Nigeria, Poland, and Tanzania? (3) What mechanisms might account for the modest but consistent pattern in which men report slightly higher mastery than women in most countries, and why do exceptions (e.g., Egypt, Japan, Turkey) emerge? (4) Which contextual forces or measurement issues drive the distinct employment-status patterns we observed in South Africa and Turkey?

Conclusion

These findings open the door to a global dialogue on the distribution and determinants of a sense of mastery across different cultures. Our results suggest that high mastery rates are achievable in diverse geographical and cultural contexts. Further, policy-makers could consider providing targeted support for demographics that are at high risk for experiencing lower levels of mastery. However, specifying exactly which policies, for which groups, first requires more evidence about the conditions that amplify or dampen mastery. Future work should therefore examine both country-level factors (e.g., welfare regimes, cultural value orientations) and individual-level factors (e.g., socioeconomic status, gender, age) as potential moderators and mediators. Our research contributes to a more nuanced understanding of global patterns in mastery, and also suggests pathways for fostering mastery within and across diverse national contexts[58].

Data availability

The data are publicly available through the Center for Open Science (COS; https://www.cos.io/gfs). All analyses were pre-registered with the Center for Open Science prior to data access (https://osf.io/wtxsk). All code to reproduce analyses are openly available in an online repository[39].

Code availability

All analyses were pre-registered with COS prior to data access; all code to reproduce analyses are openly available in the online OSF repository.

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Author contributions

E.S.K.: Conducted the data analysis, contributed to interpretation of the data, drafted the original manuscript; R.N.P.: Provided code for data analysis, contributed to the study concept and design, contributed to interpretation of the data, contributed to critical revision of the manuscript for important intellectual content; M.B.: Provided code for data analysis, contributed to interpretation of the data, contributed to critical revision of the manuscript for important intellectual content; Y.C.: Contributed to the study concept and design, contributed to interpretation of the data, contributed to critical revision of the manuscript for important intellectual content;

W.J.C.: Contributed to interpretation of the data, contributed to critical revision of the manuscript for important intellectual content; S.O.: Contributed to interpretation of the data, contributed to critical revision of the manuscript for important intellectual content; R.W.: Contributed to interpretation of the data, contributed to critical revision of the manuscript for important intellectual content; M.E.L.: Contributed to interpretation of the data, contributed to critical revision of the manuscript for important intellectual content; B.R.J.: Contributed to the study concept and design, coordinated data collection, participated in survey design, coordinated creation of code for data analysis, contributed to interpretation of the data, contributed to critical revision of the manuscript for important intellectual content; T.J.V.: Contributed to the study concept and design, coordinated data collection, participated in survey design, coordinated creation of code for data analysis, contributed to interpretation of the data, contributed to critical revision of the manuscript for important intellectual content.

Declarations

Competing interests
The authors declare no competing interests.

Informed consent
The Global Flourishing Study has been approved by several ethics committees, including the Harvard University IRB. Further, informed consent was obtained from all respondents.

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