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Legal provisions on medical aid in dying encode moral intuition

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In recent decades, many jurisdictions have moved toward legalizing euthanasia and assisted suicide, alongside a near-universal increase in public acceptance of medical aid in dying. Here, we draw on a comprehensive quantitative review of current laws on assisted dying, experimental survey evidence, and four decades of time-series data to explore the relationship between these legislative transitions and change in moral attitudes. Our analyses reveal that existing laws on medical aid in dying impose a common set of eligibility restrictions, based on the patient's age, decision-making capacity, prognosis, and the nature of their illness. Fulfillment of these eligibility criteria elevates public moral approval of physician-assisted death, equally in countries with (i.e., Spain) and without (i.e., the United Kingdom) assisted dying laws. Finally, historical records of public attitudes toward euthanasia across numerous countries uncovered anticipatory growth in moral approval leading up to legalization, but no accelerated growth thereafter. Taken together, our findings suggest that the enactment of medical aid in dying laws, and their specific provisions, crystallize patterns in moral intuition.

moral cognition | euthanasia | assisted suicide | legalization

Significance

Medical ethicists and policy analysts have long cautioned that legalizing euthanasia and assisted suicide could trigger a "slippery slope," eroding societal opposition to other forms of medicalized killing. Triangulating evidence from legal corpora, survey experiments, and time-series analyses, we find no indication that legalization alters constituents' moral reasoning about medical aid in dying. Instead, we show that public attitudes reflect a shared moral sense, align with prevailing legal criteria for patient eligibility, and predict whether and when euthanasia laws will be enacted across dozens of jurisdictions. These findings underscore the central role of moral cognition in shaping law, potentially alleviating concerns that the regulation of voluntary euthanasia paves the way for a broader acceptance of unethical medical practices.

Self-destructive behaviors are rare in the animal realm (1) and are often attributed to kin survival mechanisms (2, 3) or the effects of parasitic invasion (4). Meanwhile, voluntary self-killing is a leading cause of death among humans, particularly in early adulthood (5), making the study of suicide—and its cognitive (6) and environmental (7) determinants—one of the most profoundly human phenomena that science can strive to explain.

Most major religions have vehemently condemned suicide throughout recorded history (8, 9), although this taboo is gradually relaxing with the secularization of morality (10). Still, seeking one's own death—or even passively allowing it to occur—defies deeply ingrained intuitions. This is particularly evident in the provision of critical medical care to dying patients, where the technological capacity to artificially prolong human life beyond the point at which it is worth living raises vexed ethical questions. When, and on what grounds, should society allow suffering individuals to end their lives, or even aid them in doing so?

In the late 20th century, academic and policy debates produced careful answers to this question. It was argued, for example, that a physician may be allowed to bring about a patient's death i) by withholding life-saving treatment but not by administering a lethal injection (11), ii) as an unintended side effect of relieving the patient's suffering but not as the primary goal (12), or iii) indirectly with the patient's ultimate involvement, as in assisted suicide, but not with their own hands, as in active euthanasia (13). These distinctions, emphasizing the physician's causal and intentional role, appear to be losing traction ever since—both within scholarship (14, 15) and in public opinion, where large-scale, international surveys have documented growing support for all voluntary forms of medically assisted death (16–19).

On the legal front, we have witnessed a parallel drift toward the liberalization of euthanasia and assisted suicide—collectively referred to as "medical aid in dying". At the start of the century, only four territories allowed physicians to assist patients in fulfilling their wish to die (Oregon and Colombia in 1997, and The Netherlands and Belgium in 2002), while an additional 23 jurisdictions in eight countries have since established similar provisions. Why might these shifts in legal status and moral attitudes be taking place in parallel? Our research seeks to understand the causes of this co-occurrence of legal and moral change, exploring two nonmutually exclusive hypotheses.

Previous studies in moral psychology have shown that experimentally manipulating whether behaviors are allowed or prohibited by authorities impacts people's evaluations of their moral permissibility (20, 21), and convergent evidence has been obtained in longitudinal research on the downstream effects of real-world legislative shifts. For instance, Ofosu et al. (22) demonstrated that the legalization of same-sex marriage in various US states decreased local levels of both implicit and explicit prejudice against same-sex relations (see also refs. 23 and 24). Relatedly, a Norwegian law criminalizing the purchase of sexual services elevated moral disapproval of prostitution—though the

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effect was restricted to the Norwegian capital, where prostitution had been concentrated previously (25). This body of research motivates the hypothesis that legalization of medical aid in dying may impact moral norms. Advocates of the "slippery slope argument" (e.g., ref. 26) have highlighted the related concern that legalizing euthanasia—even under strict conditions—might erode individuals' sensibility to objectionable practices, such as mercy killing or involuntary euthanasia.

Equally, longitudinal research has shown that moral attitude change can instigate legislative and policy shifts: For example, in the context of women's rights, prior growth in emancipatory values across multiple jurisdictions promoted advances in women's legal rights (27). Similarly, Ruck et al. (28) observed that openness to diversity strongly predicted future adoption of democratic institutions and practices. These findings accord with a broader psychological theory according to which a behavior's intuitive moral appraisal informs its actual legal status (29–31). Experimental studies demonstrate that people's interpretation of written laws and statutes is strongly influenced by their moral attitudes toward the case at hand (32, 33), particularly when reasoning under time pressure (34). Research on hypothetical sacrificial dilemmas has shown that their legal treatment under the 1962 Model Penal Code (a set of criminal law guidelines widely adopted by most US states) can be described as the combined output of various competencies in moral reasoning—including mental state inference, causal reasoning, and outcome valuation (35). In a further demonstration of this phenomenon, a recent study (36) asked participants to consider a series of millennia-old offenses drawn from the Tang Code and the Laws of Eshnunna, such as gratuitously killing one's slave or failing to keep one's goring ox in check. By consulting the intensity of their moral disapproval of these culturally foreign transgressions, participants were able to retrodict the magnitude of the corresponding sanctions in both legal codes. Collectively, these studies demonstrate that the cognitive processes of moral evaluation bring to bear on reasoning about an action's legal status, motivating our second hypothesis—namely, that assessments of the moral permissibility of medical aid in dying may determine its legal status.

Is the expanding legalization of medical aid in dying around the world primarily a cause or a consequence of its increasing moral acceptability? To answer this question, we pursued multiple complementary methods: We initially consulted every (N = 27) jurisdiction that had legalized euthanasia or assisted suicide in some form by 2023 in order to identify the legal requirements for an eligible request for assistance in dying across cultures. To understand how these eligibility criteria align with people's moral reasoning about euthanasia, we conducted survey experiments (N = 2,070) in two countries differing in the legal status of euthanasia at the time of data collection: the United Kingdom (where euthanasia and assisted suicide remain illegal today) and in Spain (where they were legalized in 2021, 18 mo prior to data collection). The comparison between both countries further enabled us to understand whether legalization influences people's moral attitudes toward a physician's provision of aid in dying. Finally, we analyzed 40 y of multicountry data on attitudes toward euthanasia (N = 222,082), to understand whether growth in moral approval precedes, or follows from, its legalization.

Results

Legislative Coding. The coding exercise revealed common constraints on the eligibility of a patient's request for medical aid in dying across the 27 jurisdictions (Table 1 and *SI Appendix*, Table S1), with most laws referencing the patient's age, decision-making capacity, diagnosis, life expectancy, and the condition's reversibility (Cohen's κ = 0.94). In several jurisdictions, access to assisted dying was restricted to adult patients (adult/senior vs. minor: *RR*s [risk ratios] = 9) with a terminal prognosis (terminal vs. chronic: RR = 2.45, terminal vs. reversible: RR = 27), whose suffering originated in a physical ailment (physical vs. mental: RR = 2.70; mental vs. existential: RR = 9) and who were deemed capable of medical decision-making (capable vs. incapacitated: RR > 27). Finally, patients lacking decision-making capacity—i.e., those perceived as unable to reason autonomously about their treatment options—were universally ineligible, except when furnishing an advance directive (advance directive vs. incapacitated: RR > 6, P = 0.031). The above pairwise differences in eligibility were statistically significant (all Ps < 0.001, except where noted), according to McNemar's exact tests on the frequency of eligibility-granting jurisdictions.

Moral Approval Experiments. Next, we conducted a survey experiment in two countries: the United Kingdom (where medical aid in dying remains illegal as of 2024, N = 1,013) and Spain (where it was legalized in 2021, N = 1,057)—as a test of the effects of eligibility criteria on moral approval while conditioning on the legal status of euthanasia. In a between-subjects design, the experiment narrated a patient's hypothetical euthanasia request, while manipulating the eligibility-related attributes identified in the analysis of legal corpora: the patient's age (minor vs. adult vs. senior), decision-making capacity (capable vs. incapacitated vs. incapacitated with advance directives), diagnosis (physical disorder vs. mental disorder vs. existential suffering), and prognosis (terminal vs. chronic vs. reversible; see *SI Appendix*, Tables S2 and S3 and *Supplementary Text*). Example vignettes can be found in Fig. 1.

In Spain, an ANOVA with all four factors predicted 19% of variance in attitudes of moral approval, $F_{(8,1048)}$ = 31.45, P < 0.001. r^2 = 0.19—and every main effect achieved statistical significance. Approval was weaker for minor patients than for adults (vs. senior: B = −10.1, t = −4.41; vs. adult: B = −6.82, t = −2.95, P = 0.010), for patients diagnosed with a nonphysical disorder than a physical disorder (mental disorder: B = −10.6, t = −4.13; existential suffering: B = −24.1, t = −9.35), and for patients with reversible than irreversible prognoses (B = −13.0, t = 6.52). Meanwhile, terminal and chronic prognoses did not differ in moral approval (B = 0.32, t = 0.09, P = 1). The existence of an advance directive elevated approval among incapacitated patients (B = 10.4, t = 4.50); and, unexpectedly, approval was slightly greater for incapacitated than capable patients (B = 5.63, t = 2.45, P = 0.039).

In the United Kingdom, the ANOVA with four factors predicted 21% of variance in attitudes of moral approval, $F_{(8,1004)}$ = 32.68, P < 0.001, r^2 = 0.21. Replicating the pattern of results observed in Spain, approval was weakened by the patient's minority (vs. senior: B = −8.67, t = −3.64; vs. adult: B = −9.27, t = −3.84), by nonphysical ailments (mental disorder: B = −7.52, t = −2.81, P = 0.014; existential suffering: B = −21.0, t = −7.88), and by a prognosis of reversibility (B = −16.5, t = 7.92), whereas terminality had no independent effect (terminal vs. chronic: B = −0.42, t = −0.11, P = 0.99). The presence of an advance directive among incapacitated patients again elevated approval (B = 14.1, t = 5.89); and approval was nonsignificantly greater for incapacitated than capable patients (B = 5.29, t = 2.20, P = 0.071; all Tukey-corrected P values < 0.001 except where noted). Marginal means for both countries and each level of the experimental manipulations are reported in Table 1.

Table 1. Odds of eligibility and mean moral approval

	Eligibility odds	Moral approval	
	Legal:Illegal (% legal)	United Kingdom Mean [95% CI]	Spain Mean [95% CI]
Age group			
Senior (≥70 y old)	27:0 (100%)	50.4 [46.6, 54.1]	67.7 [64.2, 71.2]
Adult (<70 y old)	27:0 (100%)	51.0 [47.4, 54.6]	64.4 [60.8, 67.9]
Minor (<18 y old)	3:24 (11%)	41.7 [38.0, 45.4]	57.5 [54.0, 61.1]
Decision-making capacity			
Capable	27:0 (100%)	39.5 [35.3, 43.7]	56.0 [52.4, 59.5]
Advance directive	6:21 (22%)	58.8 [55.6, 62.8]	72.0 [68.5, 75.5]
Incapacitated	0:27 (0%)	44.8 [41.0, 42.7]	61.6 [58.1, 65.2]
Diagnosis			
Physical disorder	27:0 (100%)	57.2 [53.9, 60.5]	74.7 [71.6, 77.9]
Mental disorder	10:17 (37%)	49.7 [45.6, 53.8]	64.2 [60.3, 68.1]
Existential suffering	3:24 (11%)	36.2 [32.1, 40.2]	50.7 [46.7, 54.6]
Prognosis			
Terminal (irreversible and short life expectancy)	27:0 (100%)	52.9 [46.3, 59.5]	67.7 [61.5, 74.0]
Chronic (irreversible and long life expectancy)	11:16 (41%)	53.3 [50.4, 56.2]	67.4 [64.6, 70.2]
Reversible (reversible and long life expectancy)	1:26 (4%)	36.8 [33.9, 39.8]	54.4 [51.7, 57.2]

Note. CI: confidence interval.

Follow-up analyses treating participant attentiveness as a moderator of the experimental treatments revealed that the unpredicted effect of incapacitation was absent among attentive participants in both countries (ES: $B = -5.94$, $t = -1.74$, $P = 0.19$; UK: $B = 1.09$, $t = 0.38$, $P = 0.92$). In this same model, the effects of reversibility (ES: $B = -30.9$, $t = -10.4$, UK: $B = -21.8$, $t = -8.62$) and possession of an advanced directive (ES: $B = 18.9$, $t = 5.40$, UK: $B = 16.8$, $t = 5.54$) were amplified by participant attentiveness, all Ps < 0.001. Supplementary analyses additionally replicated sociodemographic differences in moral approval of medical aid in dying (see refs. 16–19 and *SI Appendix*, Table S4).

When asked whether provision of aid in dying should be legal in each case, participants' responses revealed an identical pattern: Legal approval was weakened by the patient's minority, by nonphysical ailments, and by a prognosis of reversibility. Again, terminal and chronic prognoses did not differ, the existence of an advance directive among incapacitated patients elevated approval, and approval was slightly greater for incapacitated than capable patients (*SI Appendix*, Tables S5 and S6 and *Supplementary Text*). Controlling for moral approval (ES: $B = 0.87$, $t = 54.5$; UK: $B = 0.90$, $t = 52.8$, Ps < 0.001) in the regression models of legal acceptability rendered the experimental effects nonsignificant in both countries: We observed no significant effects of a patient's minority (ES: vs. senior: $t = 0.43$, $P = 0.90$; vs. adult: $t = -2.02$, $P = 0.11$; UK: vs. senior: $t = -1.56$, $P = 0.27$; vs. adult: $t = -2.04$, $P = 0.10$), of nonphysical diagnoses (ES: mental disorder: $t = 0.45$, $P = 0.90$; existential suffering: $t = 0.56$, $P = 0.84$; UK: mental disorder: $t = -0.33$, $P = 0.94$; existential suffering: $t = -0.99$, $P = 0.58$), of reversibility (ES: $t = 1.61$, $P = 0.24$; UK: $t = 0.74$, $P = 0.74$), of advance directives (ES: $t = -1.10$, $P = 0.51$; UK: $t = -0.60$, $P = 0.82$), or of incapacitation (ES: $t = 1.10$, $P = 0.52$; UK: $t = 1.30$, $P = 0.40$). Bayesian model comparisons provided conclusive evidence for the absence of experimental effects on legal approval (with BF_{01}s > 10^4) relative to a base model with moral approval as the only predictor.

In sum, both samples exhibited qualitatively identical patterns of main effects (Fig. 2), despite differences in the legal status of euthanasia. Furthermore, participants' beliefs about the legal status of euthanasia in their country of residence had no effect on their moral approval, or on the magnitude of the effects of the patient's age, decision-making capacity, diagnosis, and prognosis (*SI Appendix*, Tables S2 and S3). Thus, conditioning on the real-world legal status of euthanasia, and on participants' beliefs about its legality, did not influence the relationship between eligibility criteria and moral approval. Additionally, moral approval appeared to screen off the effects of age, decision-making capacity, diagnosis, and prognosis on legal approval—suggesting that moral intuition may causally mediate the influence of eligibility criteria on legal approval (37).

Legal Eligibility and Moral Approval. The survey experiments revealed that five out of the seven attributes that determined legal eligibility across jurisdictions had the same directional effect on moral approval in both countries: Approval was significantly lower for 1) minor patients than for adults, for 2) existential suffering and 3) psychological disorders relative to physical disorders, for 4) reversible prognoses relative to chronic prognoses, and was

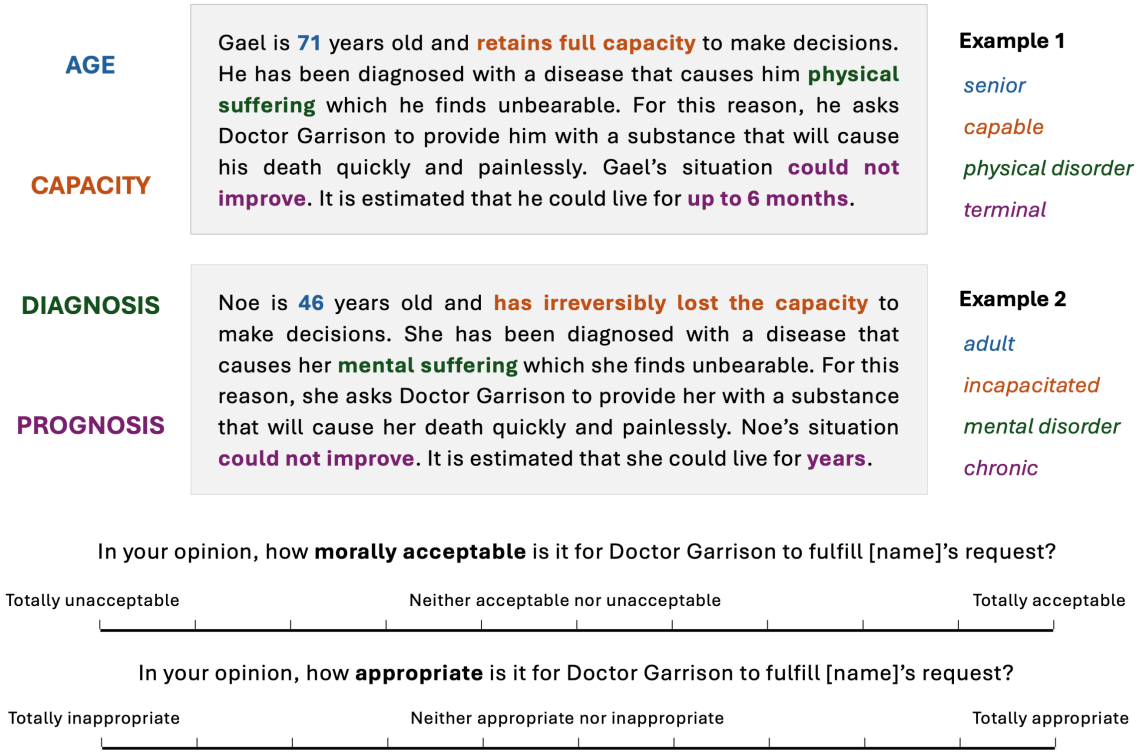

Fig. 1. Sample vignettes and dependent measures. Examples 1 and 2 illustrate two of the 63 experimental conditions. The four experimental factors are color-coded to highlight the content that randomly varied across conditions. The two items that form the moral approval dependent measure are displayed below the sample vignettes.

significantly greater for 5) incapacitated patients in possession of, versus without, an advance directive. However, 6) terminality had no effect on moral approval despite promoting legal eligibility, while 7) the effect of incapacitation was positive for moral approval and negative for eligibility.

To combine the results of all seven hypothesis tests, and evaluate whether the aggregate pattern of results provides evidence that attitudes of moral approval are related to legal eligibility, we employed Fisher's combined probability test, in which

$$X^2_{2k} = -2\sum_{i=1}^{k}\log(p_i),$$

where k is the total number of independent hypothesis tests. Combined probability tests rejected the null hypothesis that moral approval is unrelated to legal eligibility in both countries, ES: $\chi^2_{(16)} = 222.5$, UK: $\chi^2_{(16)} = 222.7$, both Ps < 0.001. Fig. 3 displays the association between mean moral approval and legal eligibility for every hypothetical request in the experiment, ES: $\rho_{(63)} = 0.35$, $P = 0.005$; UK: $\rho_{(63)} = 0.41$, $P < 0.001$.

Legalization and Public Approval. Despite the convergent effects of eligibility criteria across both countries, overall moral approval of aid in dying was higher in Spain than in the United Kingdom (Table 1 and *SI Appendix*, Table S4). This raises the possibility that the legalization of assisted dying elevates moral approval (as in refs. 22–25). Alternatively, the observed difference in moral approval could be interpreted as a cause—and not an effect—of differences in its legal status between both countries (as in refs. 27–30).

To arbitrate between these competing explanations, we examined time trends in moral approval of euthanasia across multiple countries in relation to the occurrence of legalization of aid in dying. Drawing on the European Values Study (38), which contains four decades of survey data ($N = 222{,}082$) on attitudes toward euthanasia throughout 48 countries, we classified responses as belonging to one of three quasi-experimental groups: Responses in 39 countries ($n = 164{,}502$) where assisted dying has remained prohibited throughout the entire period constituted the illegal group. Responses in the remaining nine countries where assisted dying has been legalized were further divided into the prelegal group ($n = 45{,}856$) and the postlegal group ($n = 9{,}912$), depending on whether the response was recorded before or after legalization. Comparing linear growth rates in moral approval across these three groups, with staggered treatments across countries, alleviates many of the threats to causal inference from observational research (22, 37), and allows us to assess whether growth in moral approval prompts legislative change, and whether legalization spurs growth in moral approval.

To investigate whether growth in moral approval predicts legalization, we conducted difference-in-difference analyses comparing linear growth rates between the illegal and prelegal groups (*SI Appendix*, Table S8). Countries with laws on medical aid in dying exhibited sharper prelegalization increases in euthanasia approval than did countries in which it remains illegal to this day, $B = 0.32$, 95% CI [0.29, 0.35], $t = 19.69$, $P < 0.001$ (Fig. 4*A*). Next, to assess whether euthanasia legalization precedes growth in moral approval, we compared growth in moral approval in pre- and postlegalization groups and found no significant difference, $B = -0.15$, 95% CI [−0.34, 0.04], $t = -1.60$, $P = 0.11$, $BF_{01} = 18.2$ (*SI Appendix*, Table S9).

The effect of anticipatory growth in moral approval on legalization was confirmed by calculating time-to-event for responses in the prelegal group—i.e., by centering on (subtracting) the legalization year. The effect of time-to-event was positive in the prelegal group, $B = 0.80$, 95% CI [0.78, 0.83], $t = 55.65$, $P < 0.001$. Furthermore, controlling for period effects (i.e., the year in which

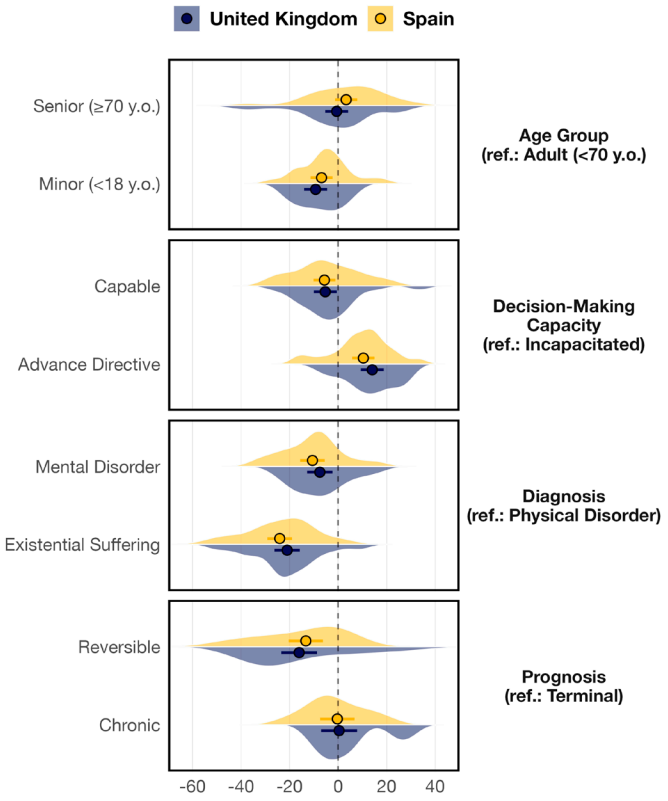

Fig. 2. Effects of age group, decision-making capacity, diagnosis, and prognosis on moral approval. Split violin plots display the distributions of simple effects by country, with overlaid marginal effects and their 95% CI. The magnitude of the effects of eligibility criteria did not differ between the United Kingdom and Spain (all *P*s > 0.47), with Bayes factors in favor of the null ranging between 30 (for the effect of prognosis) and 62 (for the effect of diagnosis).

the response was obtained) in the model revealed that approval was predicted by time-to-event, $B = 0.94$, 95% CI [0.44, 1.45], $t = 3.66$, $P = 0.011$—but not period, $B = -0.06$, 95% CI [−0.57, 0.45], $t = -0.23$, $P = 0.82$ (*SI Appendix*, Table S10). This result was confirmed with a Bayesian comparison of non-nested models, which provided moderate support in favor of a model in which moral approval depends on time-to-event relative to a model in which moral approval depends on historical period, $BF_{10} = 3.85$.

Finally, as a further test of the impact of legalization on future moral approval, we conducted regression discontinuity analyses with data from The Netherlands and Belgium—two countries for which both pre- and postlegal responses were available. This approach revealed that growth in moral approval continued after legalization ($B = 0.68$, 95% CI [0.53, 0.84]), thought at a slightly slower rate than observed before legalization ($B = 0.91$, 95% CI [0.83, 0.99]), $B = -0.22$, 95% CI [−0.47, −0.10], $t = -2.03$, $P = 0.042$ (Fig. 4*B*). Across a series of model specifications (*SI Appendix*, Table S11), Bayes factors provided moderate to substantial support for the null models without pre-to-post legalization change in the growth rate of moral approval ($3.49 < BF_{01}s < 30.0$).

Discussion

A quantitative review of laws on assisted dying, survey experiments, and four decades of public opinion data on euthanasia attitudes provided convergent evidence that legal provisions on medical aid in dying reflect cross-culturally invariant features of human moral psychology. Despite ample cultural and linguistic variation across the jurisdictions we surveyed, and an innumerable set of characteristics that could determine eligibility, qualitative coding revealed that existing laws on medically assisted death stipulate a common set of restrictions on a patient's eligibility for aid in dying: namely, adults with decision-making capacity and a terminal physical disorder—i.e., whose condition is irreversible and expected to cause death within 6 mo—are, in principle, eligible to request medical aid in dying. By comparison, underage patients, patients with reversible or merely chronic conditions, those lacking decision-making capacity, and those whose suffering stems from a psychological condition, are deemed ineligible according to most existing laws on medical aid in dying. Why might this handful of eligibility restrictions manifest reliably across cultures and jurisdictions?

Our survey experiments pointed to a role for moral intuition. These eligibility restrictions exerted convergent effects on people's *moral* views about these clinical scenarios—with the exception of decision-making capacity (39). Judgments of moral acceptability were equally responsive to various eligibility criteria in countries that differ in the legal status of euthanasia, and regardless of individuals' beliefs about its legal status. Finally, longitudinal analyses of euthanasia attitudes over the span of four decades uncovered evidence that growth in moral approval predicts the transition toward legalization across dozens of countries.

Thus, our studies provide multiple demonstrations that moral cognition influences legislation on medical aid in dying—both because culturally invariant moral intuitions inform the criteria for legal eligibility and because culture-specific trajectories of moral approval predict the likelihood of legal reform. These findings cohere with recent evidence that anticipatory changes in moral attitudes can instigate legislative and policy shifts (27, 28), and with the psychological thesis that legal reasoning implicates processes of moral cognition (40), as previously observed in relation to criminal (35, 36) and civil (34) laws.

By contrast, the hypothesis that legalization influences moral attitudes toward medical aid in dying was unsupported: First, the moral relevance of eligibility criteria was unaffected by the local legal status of euthanasia. Second, in difference-in-differences and regression discontinuity analyses, the legalization of euthanasia did

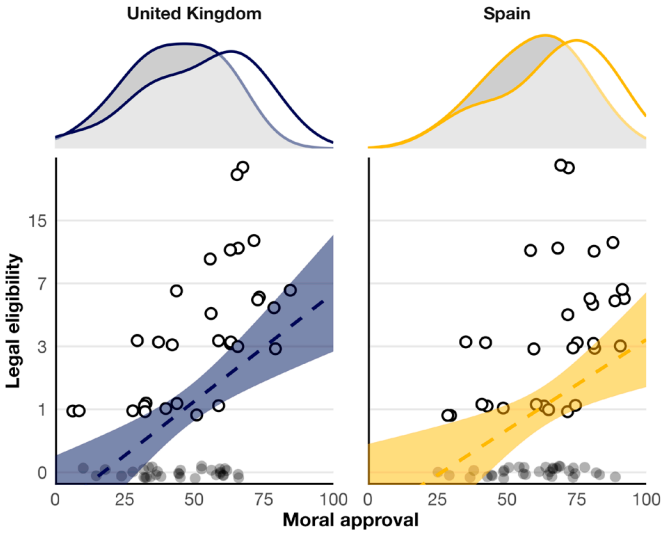

Fig. 3. Moral approval predicts legal eligibility. Grouped density and scatter plots of mean moral approval (on the *x*-axis) and legal eligibility by-scenario. The shared *x*-axis displays by-scenario moral approval separately for the United Kingdom (*Left*) and Spain (*Right*). The lower *y*-axis displays the number of jurisdictions (out of 27) in which each hypothetical request would be legally eligible on a base-2 logarithmic scale. Nonparametric rank correlations indicated that the legal eligibility of each euthanasia request was associated with its moral acceptability according to both samples. The upper *y*-axis displays the probability density grouped by whether scenarios are universally ineligible (eligible in 0 out of 27 jurisdictions) or not (eligible in at least one jurisdiction).

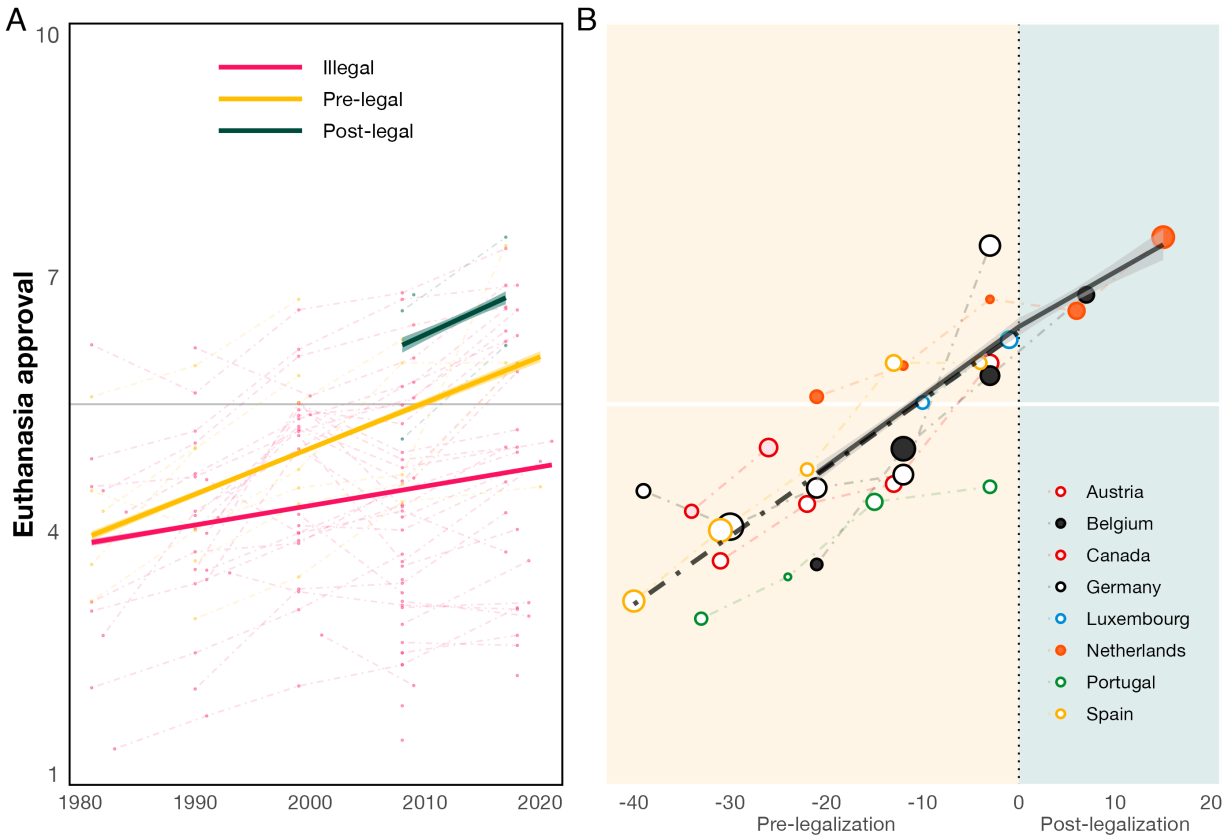

Fig. 4. Euthanasia approval by legal status. (*A*) Time-series of mean approval of euthanasia by legal status in 48 countries between 1981 and 2021. (*B*) Normalized time-series relative to legalization year in 8 countries with laws on medical aid in dying. The dash-dotted line shows anticipatory growth in moral approval in the prelegal group. The solid line depicts the regression discontinuity effect of legalization in the subset of two countries with prelegal and postlegal data (Belgium and The Netherlands).

not appear to predict accelerated growth in moral approval, by comparison to prelegalization growth rates. This result may be seen as undermining certain versions of the slippery slope argument (41, 42) that have been brought to bear against the liberalization of medically assisted death. These arguments rest on the premise that the legalization of voluntary euthanasia (and/or assisted suicide) can erode people's moral sensibility to related immoral practices, such as mercy killing or involuntary euthanasia. Yet the absence of evidence that legislative transitions impact moral attitudes suggests that these concerns may, at least in the context of medical aid in dying, be overstated.

Future research should aim to understand the mechanism by which these patient characteristics influence moral approval. In a series of exploratory analyses, we examined why the patient's age, decision-making capacity, diagnosis, and prognosis might have influenced moral attitudes, by considering a series of potential mediators (*SI Appendix*, Table S12). Tentative evidence indicated that these eligibility restrictions underscore a focus on discerning whether the patient expresses a genuine and stable wish to die (43, 44). For instance, opposition to providing aid in dying to minors, or to patients whose suffering is psychological, or whose disorders may subside over time, was largely explained by concerns that the patient's preference was unstable—such as a momentary or fleeting desire that could easily lead to future regret. This framework also sheds light on the unexpected effect of incapacitation on moral acceptability: A patient's permanent loss of decision-making capacity was not perceived as threatening the authenticity or stability of their stated preference (45), but did diminish concerns about the potential for future regret over having requested aid in dying. Follow-up evidence showed that when exposed to a technical definition of decision-making capacity, participants recognized that incapacitation precludes reasoned reflection, which annulled the positive effect of incapacitation relative to capable patients' requests (*SI Appendix*, Table S13). Still, future inquiry should seek to understand why, contrary to doctrinal views, decision-making capacity appears not to elevate people's endorsement of a patient's request for (and refusals of) treatment (see also ref. 39).

Finally, we highlight a few limitations. First, our analyses of eligibility restrictions disregarded the historical dependency between medical aid in dying laws. In other words, it is common practice for legislators to consult prior legislation when drafting new laws, pointing to the transmission of eligibility criteria between jurisdictions as an alternative explanation. Nevertheless, the question remains as to why the receivers of the original law would propose and agree to those eligibility restrictions—and our studies point toward common principles of moral cognition as a contributor to the successful transmission of legal provisions on medical aid in dying.

Second, both our experimental and historical data on euthanasia attitudes were limited in their records of postlegalization attitudes. The survey experiment in Spain was conducted shortly (18 mo) after legalization, and the time-series data were overwhelmingly composed of responses obtained under conditions of illegality (with the postlegal group making up a small fraction of the dataset). Thus, our claims about the short-term trends in postlegalization attitudes ought to be reassessed in future studies with a longer lapse from legalization.

Third, the single-item measure of euthanasia attitudes ("terminating the life of the incurably sick") in the European Values Study makes no mention of voluntariness—a crucial prerequisite in contemporary discussions on end-of-life ethics. Insofar as this

item invites a broader interpretation, it may have attenuated the association between public attitudes toward specifically *voluntary* euthanasia and its legal status.

Existing legal provisions on medical aid in dying articulate strict requirements on the eligibility of a patient's request, and these eligibility requirements appear to accord with people's intuitive moral sense. This intuitive moral sense is largely unaffected by the actual or perceived legality of euthanasia—making people no more likely to approve of eligible or ineligible acts of medical aid in dying. In this regard, our studies provide evidence that the existing legislation on medical aid in dying observes intuitive moral principles and arises in response to a growing moral demand—whereas its effects on moral cognition are weaker, or even negligible, by comparison. Larger scale efforts to consult the moral principles involved in reasoning about critical care scenarios may contribute to shaping empirically informed public policy (46).

Materials and Methods

The statistical analyses reported in this manuscript were conducted in *R* version 4.4.1. Analysis scripts, data, and full materials for the legislative coding and survey experiments have been made available on the Open Science Framework repository through the following link: https://osf.io/wx4mf/. The studies complied with all relevant ethical regulations, including the 1964 Declaration of Helsinki and its later amendments, and obtained ethical approval (3058/CEIH/2022) from the Research Ethics Committee at the University of Granada.

Legislative Coding.

Data sources. Two types of legal sources were consulted for each country: legislation (including laws, acts, and codes) and judgments of the highest courts. For countries where access to medical aid in dying is established by a single law and its amendments endorsed by parliament (i.e., Austria, Belgium, Canada, Luxembourg, New Zealand, Portugal, Spain, Switzerland, and The Netherlands), we used the European Union's N-Lex interface (https://n-lex.europa.eu/n-lex/index), which identifies and connects to official national databases, to search for the current legislation. For Australia and the United States, where states have their own regional laws regulating assistance in dying, we carried out a direct search through the official database for each jurisdiction. Finally, for those countries (i.e., Germany and Colombia) where access to aid in dying is not established in a parliamentary law, the specialized jurisprudence database vLex (https://app.vlex.com/) was used to retrieve higher court rulings. Online records of the legal sources we employed in quantitative coding can be accessed through *SI Appendix*, Table S1.

Coding scheme. Our codebook defined a series of 12 attributes along four dimensions (age, decision-making capacity, diagnosis, and prognosis; see Table 2). For each of the ($N = 27$) legal texts in *SI Appendix*, Table S1, we ask whether the 12 attributes are stipulated as either inclusion or exclusion criteria. We code an attribute as an inclusion criterion if the legislation mentions that attribute as a requirement for eligibility. We code an attribute as an exclusion criterion if the legislation explicitly refers to the attribute as grounds for ineligibility. We code an attribute as included by omission if the legislation does not mention any of the attributes in the same dimension (whether as requirements for eligibility, or as grounds for ineligibility).

To establish the dichotomous eligibility of each case ($i = 63$), we define the eligibility of a factorial combination of attributes (e_{jklm}) as the product of the eligibility of its attributes:

$$e_{jklm} = \prod_{j}^{m} e_i,$$

where e_i equals 1 if attribute i is either an inclusion criterion or is included by omission, and 0 if i is an exclusion criterion.

Intercoder reliability check. Two independent coders applied the above coding scheme and obtained an intercoder reliability coefficient (Cohen's κ) of 0.94. Disagreements were resolved by recruiting a third coder and applying the tie-breaker method. The third coder applied the same coding scheme to the disagreements ($i = 9$) between the original two coders, while blind to their responses and identities. In the tie-breaker method, the mode response among the three coders for each disagreement establishes the final response, effectively "breaking the tie" between the two original coders. The results of this coding exercise are reported in Table 1.

Survey Experiments.

Materials and procedure. Materials were drafted in Spanish and translated into English. The experiment was modeled after the conjoint analysis technique (47) employed in political science and marketing research. Each participant was randomly assigned to one condition in a 3 (age group: minor, adult, senior) × 3 (decision-making capacity: capable, incapacitated, incapacitated with advance directive) × 3 (diagnosis: physical disorder, mental disorder, existential suffering) × 3 (prognosis: reversible, chronic, terminal) between-subjects, fractional factorial design. Of a possible 81 conditions, we dropped 18 conditions involving implausible combinations of a nonphysical ailment having a terminal prognosis, resulting in 63 experimental conditions. In addition, each patient was randomly assigned a gender neutral name (from a set of three names) and a gender (male or female). Within each level of the age group manipulation, patients were assigned a specific

Table 2. Eligibility-related attributes and their definitions

Dimension	Attribute: definition
Age group	○ *Senior*: a person 70 y of age or older ○ *Adult*: a person 18 y of age or older ○ *Minor*: a person under 18 y of age
Decision-making capacity	○ *Capable*: a person with decision-making capacity at the time of the request ○ *Advance directive*: a person without decision-making capacity at the time of the request who had formally requested medical aid in dying through a living will, testament, or advance directive ○ *Incapacitated:* a person without decision-making capacity at the time of the request
Diagnosis	○ *Physical disorder*: a person with a physical health disorder who suffers unbearable physical pain ○ *Mental disorder*: a person with a psychiatric or mental health disorder who suffers unbearable psychological distress ○ *Existential suffering:* a person without a medical diagnosis who suffers unbearable existential suffering
Prognosis	○ *Terminal*: a person whose suffering and/or ill health will not subside in the future AND whose life expectancy is fewer than six months in the opinion of medical experts ○ *Chronic*: a person whose suffering and/or ill health will not subside in the future AND whose life expectancy is greater than six months in the opinion of medical experts ○ *Reversible:* a person whose suffering and/or ill health could subside in the future in the opinion of medical experts

age by sampling from the uniform distributions from 12 to 17 (minor), 18 to 69 (adult), and 70 to 85 (senior).

At the beginning of the study, participants viewed a hypothetical request for medical aid in dying (Fig. 1) and were asked to judge whether providing medical aid in dying would be morally acceptable and whether it should be allowed by law. Moral approval was the two-item average (Cronbach's $\alpha = 0.95$) of: (M_1) "In your opinion, how morally acceptable is it for the doctor to fulfill [the patient]'s request?" from 0: "Totally unacceptable" to 100: "Totally acceptable," and (M_2) "In your opinion, how appropriate is it for the doctor to do what [the patient] requests?," from 0: "Totally inappropriate" to 100: "Totally appropriate." Legal approval was the two-item average (Cronbach's $\alpha = 0.96$) of: (L_1) "The law should allow health professionals to do what [the patient] requests" (from 0: "Strongly disagree" to 100: "Strongly agree"), and (L_2) "In your opinion, how appropriate is it for the law to allow health professionals to fulfill [the patient]'s request?" (from 0: "Totally inappropriate" to 100: "Totally appropriate").

Participants were asked four comprehension questions, concerning the patient's diagnosis ([1] "What motivated [the patient]'s request?"), decision-making capacity ([2] "At the time of his/her request, did [the patient] have the capacity to make decisions for him/herself?"), the condition's reversibility ([3] "Could [the patient]'s situation improve?"), and terminality ([4] "How long is [the patient] expected to live for?"). For each comprehension question, there were either two or three response options. For example, the response options for the reversibility question were "Yes," and "No," while for the terminality question, they were "Fewer than 6 mo" and "More than 6 mo." Thus, for each comprehension question, one response option was correct (and coded as 1), depending on the participant's condition assignment, and at least one was incorrect (and coded as 0). The sum score of correct answers, ranging from 0 to 4, served as a measure of participants' attentiveness. Additionally, they were asked a series of supplementary questions about the patient's preference, which are described in detail *SI Appendix*, Table S10.

In the second part of the study, participants read an abridged, technical definition of euthanasia ("Suppose a doctor takes action to directly and intentionally cause the death of a person who is in a situation of serious, chronic, and disabling illness or serious and incurable illness, experiencing unbearable suffering that cannot be alleviated in a way that he or she considers acceptable, and that person has freely, repeatedly, and in an informed manner, requested that such actions be carried out.") and were asked to select one of two statements, according to whether what this doctor does is "illegal" or "legal" in their country (i.e., the United Kingdom or Spain). At the end of the study, participants provided additional sociodemographic information, about their religious beliefs, political orientation, and educational attainment.

Participants. Based on an a priori power analysis drawing on pilot data, we established a target sample size of 1,000 participants per country. Participant samples were recruited in partnership with Prolific (www.prolific.com) and Netquest (www.netquest.com). Prolific is an online platform dedicated to online recruitment of research participants for browser-based studies. Panelists must be 18 y of age or older and are enrolled via word of mouth, social media, and invitation. Netquest is an online research firm providing access to panels in Spain, Portugal, and multiple Latin American countries, where panelists are recruited via social media and by invitation. Informed consent was obtained from all research participants at the beginning of the study.

In December 2022, 1,348 adult Spanish residents accessed our survey experiment via Netquest. Throughout the recruitment period, we withdrew 275 invitations to participants in quotas that had already filled, to ensure proportional quota sampling. Of the remaining 1,073 invited participants, 16 (1.5%) did not consent to participate in the study, resulting in a final sample size of 1,057. This sample was representative of the adult population of Spain with respect to age (with a median age of 48 [$Q_1 = 38$, $Q_3 = 63$]), gender (50% men, 50% women, <1% nonbinary), and geographical region (Nielsen classification with seven levels). The sample was politically balanced ($Mdn = 5$: "Center"; $M = 4.47$, $SD = 2.15$), and many participants identified as Catholic (47%) or nonreligious (Atheist: 22%; Agnostic: 18%).

In May 2023, 1,037 adult residents of the United Kingdom accessed our survey experiment via Prolific. Of these, 24 participants did not complete the study (2.3%), resulting in a final sample size of 1,013. The sample was representative of the adult population of the United Kingdom with respect to age (median age of 45 [$Q_1 = 32$, $Q_3 = 59$]), gender (49% men, 51% women, <1% nonbinary), and ethnicity (Asian: 7%; Black: 3%; Mixed: 2%; Other: 1%; White: 87%). The sample was also politically balanced ($Mdn = 5$: "Center"; $M = 4.23$, $SD = 2.12$), with many participants identifying as nonreligious (Atheist: 34%, Agnostic: 17%) or as belonging to a Christian denomination (Catholic: 10%; Protestant: 15%; Other Christian: 10%).

In July 2024, 707 adult residents of the United Kingdom accessed our follow-up study via Prolific (*SI Appendix*, Table S13). Of these, 104 participants did not complete the study (14.7%), resulting in a final sample of 603 participants. The sample was representative of the adult population of the United Kingdom with respect to age (with a median age of 49 [$Q_1 = 33$, $Q_3 = 59$]), gender (48% men, 51% women, and 1% nonbinary), and ethnicity (Asian: 8%; Black: 3%; Mixed: 2%; Other: 2%; White: 84%). The sample also exhibited balance in political orientation ($Mdn = 5$: "Center"; $M = 4.27$, $SD = 2.07$) and a predominance of irreligious (Atheist: 31%; Agnostic: 15%) or Christian (Catholic: 9%; Protestant: 12%; Other Christian: 13%) worldviews.

Statistical analysis plan. Preregistrations were published on the AsPredicted platform (see https://researchbox.org/3360&PEER_REVIEW_passcode=SWEADA). Our primary preregistered analyses were a series of ANOVAs and linear regression models with all four factors for each country and both dependent measures. The analyses were conducted in *R* version 4.4.1 using the *stats, car,* and *jtools* packages.

In a series of exploratory analyses, we entered participant scores on the comprehension checks and their belief about the legality of euthanasia as separate moderators. Finally, we also entered legal approval in the model of moral acceptability, and moral approval in the model of legal acceptability, as covariates. These analyses are reported in full in *SI Appendix*, Tables S2–S6.

Due to the constraints of our fractional factorial design, we have omitted the interaction terms and reported the main effects only model in the Results section. In this model, variance inflation factors are all below 1.08, indicating that multicollinearity among the predictors is not a concern. *SI Appendix*, Table S7 reports the analyses of variance by decomposing the fractional design into two overlapping and full factorial subsets: Subset 1, a 3 Age Group × 3 Capacity × 3 Diagnosis × 2 Prognosis (i.e., without the Terminal level of Prognosis); and Subset 2, a 3 Age Group × 3 Capacity × 3 Prognosis (i.e., without the Mental and Existential levels of Diagnosis).

Secondary Data Analysis.

Data sources. Time-series data on euthanasia approval were drawn from the European Values Study (europeanvaluesstudy.eu/methodology-data-documentation/evs-trend-file-1981-2017/data-and-documentation-evs-trend-file/). Country-level controls were drawn from the International Monetary Fund (www.imf.org/en/Publications/WEO/weo-database/2022/April) and the Central Intelligence Agency (www.cia.gov/the-world-factbook/field/religions/).

Variables. From the European Values Study, we drew five variables for our analyses: Our primary dependent measure was euthanasia approval [F122], which ranged from 1: "never justifiable" to 10: "always justifiable." Additionally, we recorded the country [COW_NUM] and year [S020] in which each response was obtained and the respondent's age [X001] and sex [X003].

From the International Monetary Fund, we drew one additional variable: gross domestic product per capita at constant (2017) price and expressed in dollars [NGDPRPPPPC] for each country and year. From the Central Intelligence Agency Factbook, we obtained the primary religion for each country. From our legislative coding, we obtained legalization years for the subset of countries in which euthanasia had been legalized. National data on primary religion, legalization year, and time-varying gross domestic product (GDP) per capita were then added to our primary dataset by matching by country (for primary religion and legalization year) and country and year (for GDP per capita). For purposes of statistical analysis, GDP per capita was log-transformed (base 10) and years were converted into decades and centered on the year 2000.

Statistical analyses. Analysis 1 adopted a difference-in-differences approach by regressing euthanasia approval on time (in decades; centered on the year 2000), group, and the time × group interaction in linear mixed-effects models, with a random intercept per country.

Analysis 2 was a time-to-event analysis. For the subset of prelegal responses, time-to-event for response *i* in country *k* was calculated as

$$\text{time to event}_{ik} = \text{year}_{ik} - \text{legalization year}_{k},$$

where $year_{ik}$ represents the year in which the response was recorded, and $legalization\ year_k$ represents the year in which euthanasia was legalized in country *k*. In a linear mixed-effects model, we regressed euthanasia approval on year and time-to-event, with a random intercept per country.

Analysis 3 was a regression discontinuity model. In a linear mixed-effects model, we regressed moral approval on time-to-event and the time-to-event × group interaction. The group term was omitted from the model (i.e., constrained to zero) under

the plausible assumption that legalization would not produce a sudden intercept shift at the onset of legalization, but only influence the slope of approval over time.

Data, Materials, and Software Availability. Analysis scripts, anonymized data, and study materials have been deposited in the Open Science Framework (https://osf.io/wx4mf/) (48).

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