WOMEN'S HEALTH

Two paradoxes in women's well-being

Caspar Kaiser[1,2]*†, Naomi Muggleton[1]*†, Edika Quispe-Torreblanca[3]*†, Jan-Emmanuel De Neve[2,4]

We review the literature on the gender gap in well-being, identifying two key paradoxes. First, although women today report higher levels of life satisfaction and overall happiness than men, they experience worse outcomes in mental health and negative affect. Second, despite substantial advances in women's social and economic status over the past 50 years, their well-being relative to men has declined. We explore the evidence supporting these paradoxes, considering potential explanations related to differential expectations, biology, and scale use. Using global data from 2006 to 2023 and long-term data from Europe and the US since the 1970s, we provide empirical illustrations. These findings reveal a diverse and seemingly inconsistent pattern of gender well-being gaps between countries, suggesting that the first paradox is not universally applicable. However, there is clear global evidence of a relative decline in women's well-being, particularly in terms of negative affect.

INTRODUCTION

Women face structural disadvantages compared to men. They earn less (*1*–*3*), are less likely to be in employment (*4*–*6*), spend more time on domestic work and caregiving (*7*–*9*), have lower levels of wealth (*10*–*13*), are underrepresented in political (*14*, *15*) and business leadership (*16*), and are more likely to be the victim of sexual harassment (*17*, *18*). Although these disparities vary in magnitude, they are near universal throughout the world and are slowly narrowing (*1*, *4*).

These persistent inequalities not only reflect gender disparities in society but also have substantial implications for well-being. Well-being is a key indicator of overall quality of life, making differences in well-being among genders particularly important to understand and address. However, is there a gender well-being gap? If so, is it closing?

This paper reviews the relevant literature on these questions and provides empirical illustrations. For earlier reviews, with different foci, see (*19*, *20*). Although much of the wider research on gender focuses on objective characteristics, our analysis centers on subjective well-being. In this context, researchers often divide subjective well-being into three categories: evaluative, affective, and eudaimonic well-being (*21*). Because of the relative scarcity of research on eudaimonic well-being, we focus primarily on evaluative and affective aspects, with some discussion of disparities and trends in physical pain.

The answers to these questions are more complex than one might expect, revealing two paradoxes. First, women's evaluative well-being, such as life satisfaction and overall happiness, tends to be higher—not lower—than men's. Yet, in terms of mental health and affective well-being, especially negative affect, women fare worse. This is despite the common finding that the former type of well-being is more affected by socioeconomic factors than the latter. Adjusting for these factors only deepens the paradox. Second, despite improvements in objective conditions, women's well-being has not improved relative to men's. Women's well-being in areas such as negative affect, mental health, and physical pain has been declining, a trend observed globally.

We explore various explanations for these paradoxes, including differences in reference standards (to whom people compare themselves when assessing their well-being), biological factors, cultural factors, and variations in how individuals use well-being scales. The literature has yet to reach a consensus on which of these mechanisms best explains the observed patterns, partly due to the lack of comparative data across different populations and contexts.

The paper proceeds as follows. The section "The cross-sectional female well-being paradox" reviews the literature on the first paradox, supported by graphical illustrations using Gallup World Poll data. These illustrations make the relatively underappreciated point that there is an unexpectedly wide variety of gender gaps across countries and world regions. This speaks against biological explanations and suggests social causes instead. The section "The longitudinal female wellbeing paradox" focuses on the second, historical paradox. We again review the relevant literature on evaluative well-being, affective well-being, mental health, and physical pain. The discussion is here supplemented with data that shows long-run trends for individual countries [from the US General Social Survey (GSS) and the European Eurobarometer] and more short-run global trends (from the Gallup World Poll). These analyses build on previous research that leverages these and other datasets [see, e.g., (*22*–*27*)]. A final section concludes.

THE CROSS-SECTIONAL FEMALE WELL-BEING PARADOX

Our first paradox concerns the differences in men's and women's well-being at a given point in time. This type of paradox has previously been documented by, e.g., (*27*–*29*). Two seemingly contradictory empirical regularities underpin this paradox: Across time periods and geographic regions, women generally report greater life satisfaction and overall happiness than men. Yet, women also experience higher levels of mental health issues, negative affect, and pain. In other words, women appear to be relatively better off in evaluative measures but worse off in affective measures, which is the essence of the paradox.

Evidence on mental health, negative affect, and pain

Women consistently exhibit worse mental health than men, reporting higher levels of depression, anxiety, and irritability (*22*, *30*–*32*). They are also more frequently diagnosed with mood disorders and are more likely to use mental health services and medications such as antidepressants (*33*). Women also experience more intense emotional responses to negative life events compared to men and are less likely to be satisfied in the moment, with lower self-reported calm,

[1]Warwick Business School, University of Warwick, Coventry, UK. [2]Wellbeing Research Centre, University of Oxford, Oxford, UK. [3]Leeds University Business School, University of Leeds, Leeds, UK. [4]Saïd Business School, University of Oxford, Oxford, UK.
*Corresponding author. Email: caspar.kaiser@wbs.ac.uk (C.K.); naomi.muggleton@wbs.ac.uk (N.M.); e.quispe-torreblanca@leeds.ac.uk (E.Q.-T.)
†These authors contributed equally to this work.

cheerfulness, and vigor (*22*). These disparities are observed globally: Across most world regions, women feel much less safe at night and are more worried, sad, and depressed (*23*). These gaps are particularly consistent in Latin America and Western Europe.

Social norms appear to be one driver of the gender gap in mental health (*34*). Women often face societal expectations that emphasize caregiving, emotional expressiveness, and compliance, leading to increased psychological distress (*35*). For example, among Americans, women's higher levels of interpersonal caregiving and involvement in others' problems significantly contribute to their higher levels of depression, accounting for 25% of gender differences in distress (*36*). Traditional gender roles further exacerbate these disparities as women often face greater stress from balancing domestic and occupational responsibilities (*37*, *38*). Cultural norms tend to encourage boys to be competitive and emotionally restrained, whereas girls tend to be encouraged to be empathetic and nurturing (*39*, *40*). This socialization process discourages men from expressing vulnerability, potentially skewing the perceived prevalence of depression among genders (*41*). In addition, women's socialization tends to be more emotionally expressive and empathetic (*42*), making them more open to experiencing and reporting emotions, both positive and negative (*43*). Women are also more likely to internalize stressors, leading to higher instances of rumination, a known predictor of depression (*44*–*46*). Consequently, these social norms could contribute to higher rates of depression and related negative emotional states in women.

Biological factors also play a role in this gender gap. Women may experience higher rates of negative affect due to greater fluctuations in reproductive hormones across their life span, which can contribute to increased rates of affective disorders (*47*–*49*). The gender difference in depression rates typically emerges around puberty (*31*, *32*, *50*), suggesting that reproductive hormones significantly influence the onset of affective disorders in women. Hormonal changes during the postpartum period (*48*), perimenopause and menopause (*51*), and premenstrual period (*52*, *53*) further explain the higher prevalence of depression in women. In addition, genetic factors, such as variation in the genotype monoamine oxidase A (MAOA), which is primarily responsible for the regulation of neurotransmitters like serotonin and dopamine, may also play a role (*54*). The *MAOA* gene, located in the X chromosome, is associated with emotional regulation and has been linked to increased susceptibility to stress and mood disorders, particularly in women (*54*).

These gender differences extend to physical health. Women are at higher risk for many chronic pain conditions compared to men. Population-based research consistently shows greater pain prevalence among women for conditions such as fibromyalgia, migraines, chronic tension–type headaches, irritable bowel syndrome, temporomandibular disorders, and interstitial cystitis (*55*–*60*). Experimental pain studies further indicate that women exhibit greater pain sensitivity, enhanced pain facilitation, and reduced pain inhibition (*61*). Large-scale survey data also reflect these differences; for instance, European Social Survey (ESS) data show that physical pain is more common in women than in men (*62*). Socioeconomic inequalities in pain are also generally higher for women. As one example, women with low education have a 14% higher prevalence of hand and arm pain compared to those with high education, whereas the difference for men is 8%. Gallup World Poll data reveal similar disparities, with women reporting a greater increase in physical pain during economic downturns than men (*63*).

Evidence on life satisfaction and happiness

The evidence on life satisfaction and happiness largely stands in contrast to findings on mental health and physical pain. In nationally representative samples, and across income and education levels, women generally report higher levels of life satisfaction than men, particularly when taking into account individual characteristics and life circumstances (*24*, *64*–*66*). This gap is most pronounced among men and women below the age of 60 (*67*). Similarly, women-favoring gender gaps in evaluative well-being are observed globally when looking at individuals in full-time work (*68*) or when focusing on job satisfaction in particular [e.g., (*69*, *70*)]. Women also tend to experience more intense positive emotions and are more open to positive emotional experiences, often reporting greater happiness and joy (*71*–*73*).

These patterns hold across most world regions (*24*), various datasets (*65*), and date back to the 1970s and 1980s (*25*, *66*). The gender gap in life satisfaction is notably larger in the Middle East and North Africa as well as East Asia. It is smaller, and sometimes reversed, in Post-Communist countries, Latin America, and Sub-Saharan Africa (*23*, *26*, *74*). However, not all studies find consistent patterns across world regions (*65*), and year-by-year comparisons show significant volatility in the regional rankings of the gender gap (*26*). The sign and size of the gender gap also fluctuate throughout the year, with women doing better between February and August and men doing so between September and January (*75*). Despite these variations, a women-favoring gender gap in evaluative well-being is evident in most individual countries globally (*19*).

Although the women-favoring gap is most pronounced among younger adults, life satisfaction levels among adolescents appear to be higher for boys than for girls (*76*, *77*). The same studies also document worse mental health and negative affect among girls in the same samples. Hence, the paradox seems to emerge in adulthood.

The paradox among adults has been observed within a single dataset (ESS) on a common set of respondents (*28*). This suggests that the paradox is not simply an artifact of varying sampling strategies across surveys. However, this evidence has been questioned, with subsequent analysis indicating that the paradox is only apparent when adjusting for socioeconomic covariates (*78*). Moreover, a recent work suggests that, in Europe and the US, women are no longer more satisfied and happier in later survey years, especially since the COVID-19 pandemic (*27*). Similarly, in a recent meta-analysis of 281 reported effect sizes, which included estimates based on nonnationally representative samples, women's life satisfaction was not found to be larger than men (*79*).

In summary, although there is clear evidence that women experience greater evaluative well-being than men in global and nationally representative samples of adults, this gap seems to be inverted among adolescents and cannot be observed in analyses including nonrepresentative samples. The evidence also shows that the gap among adults has been declining, a trend further explored in the section "The longitudinal female well-being paradox."

Explanations

Biological explanations and emotional intensity

Biological factors, particularly hormonal fluctuations, play a significant role in shaping women's emotional experiences and may help explain the observed differences in well-being between genders.

Hormonal changes during the menstrual cycle, pregnancy, and menopause influence mood and emotional states, leading to

more intense emotional experiences, both positive and negative (*31*, *32*, *47*–*52*).

As discussed in the previous section, these fluctuations may contribute to the higher prevalence of depression and anxiety among women. However, they also likely enhance the intensity of positive emotions. For example, studies suggest that women are more emotionally responsive than men, experiencing both highs and lows more intensely. Some argue that this greater emotional openness makes women more susceptible to intense happiness and severe depression (*72*). Further evidence supports this, indicating that women report stronger positive emotions (*80*–*82*) and more intense negative emotions (*81*–*83*), potentially balancing their overall well-being.

Moreover, women often show heightened stress responses (*37*, *84*), with increased brain activity in regions associated with depression and anxiety, such as the amygdala, thalamus, and caudate (*85*–*87*). This heightened emotional intensity might result in women experiencing more pronounced positive affects during good times and more severe lows during bad times.

Differing expectations and cultural norms

Another explanation for the gender well-being paradox is differing expectations between men and women. Research indicates that these expectations, shaped by societal norms, cultural values, and personal experiences, can significantly affect reported well-being (*25*, *29*, *65*, *69*).

Thus, higher levels of life satisfaction among women could be due to lower expectations in the socioeconomic domain, such as career advancement, income, or work-life balance (*25*, *69*, *88*–*90*). Women who have historically faced barriers in these areas may derive greater satisfaction from their achievements as their expectations are more likely to be met or exceeded. In contrast, men, whose higher expectations in these domains might not always align with outcomes, could experience more dissatisfaction when goals are unmet. Some studies show that, despite lower pay and fewer promotions, women often report higher job satisfaction, likely because of these lower initial expectations (*69*, *90*). When studies control for factors like income, education, and employment more generally, the gender gap in well-being often increases (*25*, *69*, *78*).

Moreover, men tend to link their evaluative well-being more closely to income and job status, which may explain their greater dissatisfaction when these expectations are unmet (*91*). This difference in the weight men and women place on different domains of life may therefore add to the observed gap in well-being.

Expectations are only one part of the picture, however. Societal and cultural factors, such as legal equality, also shape the well-being gap. In cultures that favor gender equality, actual gender equality is associated with smaller gender differences in subjective well-being (*92*). Similarly, the extent to which legal equality across genders is associated with well-being gaps varies across countries. In low- and middle-income countries, equal gender rights are associated with greater relative well-being among women, whereas in high-income countries, greater formal equality is associated with lower well-being among women than men (*26*).

Although legal equality across genders can influence well-being in various contexts, broader governance quality and welfare state structures may also play a role. However, the evidence on these associations remains limited; for example, at least one study finds no association between European welfare state regimes and the gender gap in well-being (*93*).

Overall, differences in expectations, social norms, and objective conditions interact in generating the observed well-being gaps. For example, although women in social democratic welfare regimes derive similar mental health benefits from employment as men, no such associations could be observed among women in culturally more traditional liberal and conservative welfare regimes (*94*). US data from the 1980s also show that employment correlates more strongly with happiness among Black women than among white women (*95*). More generally, across studies from high- and low-income countries, it appears that, when objective gender equality conflicts with unequal subjective norms, the literature tends to observe lower levels of mental health and well-being (*96*–*100*).

Measurement and methodological considerations

Differences in how men and women use survey scales to respond to well-being questions could also explain the gender well-being paradox. Women might report both positive and negative experiences more intensely, thereby biasing survey results on gender gaps in life satisfaction and emotional states. In addition, men and women might prioritize different life domains when answering life evaluation questions.

To explore this, a recent work (*101*) used introspective questions asking respondents to consider how they weigh different life domains—such as physical and mental health, family relationships, and income—along with time horizons and social circles when responding to well-being questions. Women prioritized financial security, family life, and health more than men, who gave greater weight to work, social status, and hobbies. Moreover, women tended to focus more on the immediate present, whereas men placed more importance on long-term assessments, like their entire life or future expectations. Socially, women emphasized themselves and their immediate family, whereas men considered broader circles, including their community and country. These differences suggest that men and women differ in their interpretation of evaluative well-being questions, leading to gendered variation in responses even when objectives circumstances are held constant.

However, it remains unclear whether these differences can fully explain the observed gender disparities in reported life satisfaction. Some evidence suggest otherwise: When individuals are prompted to compare themselves to others of the same gender, women adjust their satisfaction levels upward for health and income but not for life satisfaction. Men's responses show little to no change in general (*102*). Thus, although gendered question interpretations do influence well-being reports, the fact that women—despite being generally more disadvantaged in multiple domains—still report higher life satisfaction suggests that such effects do not fully account for the life satisfaction gap between genders.

Nevertheless, researchers have documented scale-use differences. When correcting for measurement errors in life satisfaction scales, the gender gap can reverse from favoring women to favoring men (*103*), providing further evidence to show that men and women interpret and respond to survey questions differently. Some studies have addressed this directly by using vignettes, where respondents assess the well-being of fictional characters. These adjustments often show that the raw gender gap in life satisfaction reduces after correcting for scale-use differences (*104*, *105*).

Illustration of the first paradox

Data and methods

We now illustrate the paradox with global data. To do so, we use the Gallup World Poll, covering 168 countries from 2006 to 2023. This

dataset captures between 78.44% (2023) and 98.07% (2014) of the global population, with an average coverage of 93.31%. For each country, we computed the gender well-being gap across four outcomes measures: (i) life evaluation, where respondents rate their current life on a scale from 0 (worst possible life) to 10 (best possible life); (ii) a positive affect index that combines feelings of being well rested, smiling or laughing, and experiencing enjoyment the previous day (scaled 0 to 3); (iii) a negative affect index that includes feelings of worry, sadness, stress, and anger reported for the previous day (scaled 0 to 4); and (iv) a measure of physical pain experienced the previous day (scaled 0 to 2).

The total sample consists of $N = 2{,}562{,}000$. Within each country-wave, we observe an average of 1149 respondents, ranging from $N = 500$ to $N = 13{,}408$. We weight all estimates for national representativeness and apply additional population weighting when pooling estimates across countries. The figures in the main text show the raw (but weighted) differences in well-being between men and women. Additional ordinary least squares regressions that control for, first, age and age-squared and, second, for socioeconomic factors (the presence of children, employment status, education, income, and marital status) are shown in the Supplementary Materials. All empirical sections rely on secondary data, where the data providers obtained informed consent from participants. The University of Leeds Research Ethics Team determined that this research is exempted from further ethical approval.

Results

Global versus regional estimates of the gender gap. Figures 1 and 2 display the unadjusted gender gap in life evaluation and negative affect across countries, defined as the difference between women's and men's scores (see also tables S1 and S2 for descriptive statistics). Regional averages are shown below the individual country estimates.

Across all world regions, we find a negative gap in negative affect, disfavoring women. A positive gap in life evaluation (i.e., favoring women) is found in only three of the six regions. Those include the Middle East and North Africa, the Americas, and Asia. Conversely, we observe negative gender gaps in life evaluation in Europe, the former Soviet Union, and Sub-Saharan Africa. Thus, in more than half of all countries (51.6%), the Gallup World Poll, the cross-sectional gender paradox does not hold. In terms of statistical significance (at the 5% level), we find a significant positive gap in 48.4% of countries, a significant negative gap in 17.6%, and null effects in 34.0% of countries (Fig. 1).

Globally, the gender gap in life evaluation is positive at 0.16, whereas the global gender gap in negative affect is negative at −0.08. In this sense, the paradox does hold at an aggregated global level. However, these gaps are modest. The global SDs in life evaluation and negative affect are ~2.4 and 1.3, respectively (see table S1). Therefore, the average gender life evaluation and negative affects gaps only amounts to about 6.67 and 6.15% of an SD.

As shown in Figs. 1 and 2, substantial variation in gender differentials across countries, even within the same region, dwarfs these overall differences. For life evaluation, nearly all world regions (except the Middle East and North Africa) include countries with positive, negative, and no significant gender gaps. The variance in estimated gender differences across countries (0.029 for life evaluation and 0.012 for negative affect) clearly exceeds the variance across regions (0.0099 and 0.0066, respectively). Hence, individual countries exhibit varied and idiosyncratic gender gaps in well-being, with no clear overarching pattern. We observe a statistically significant

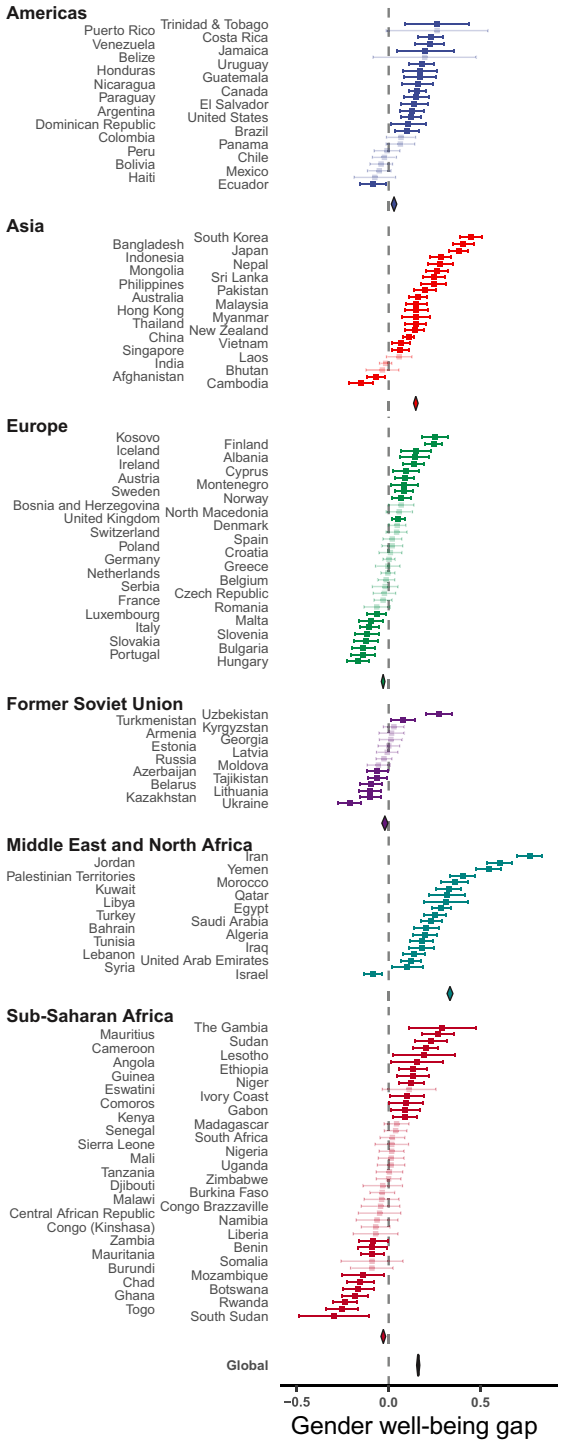

Fig. 1. Unadjusted gender gaps in life evaluations across countries, world regions, and globally. The dots represent the gender coefficient from a multiple regression model for each country, with 95% confidence indicated by error bars ($N = 2{,}562{,}000$). Diamonds represent combined estimates for regions (colored) and globally (black), where the width of the diamond reflects the 95% CI. Positive estimates indicate that women have higher life evaluations than men for a given region. The vertical dashed line represents gender parity with respect to life evaluations, and faded bars indicate nonsignificant results. We base our estimates on Gallup World Poll data from 2006 to 2023, with dummy controls for survey wave. See the section "Illustration of the first paradox" for discussion.

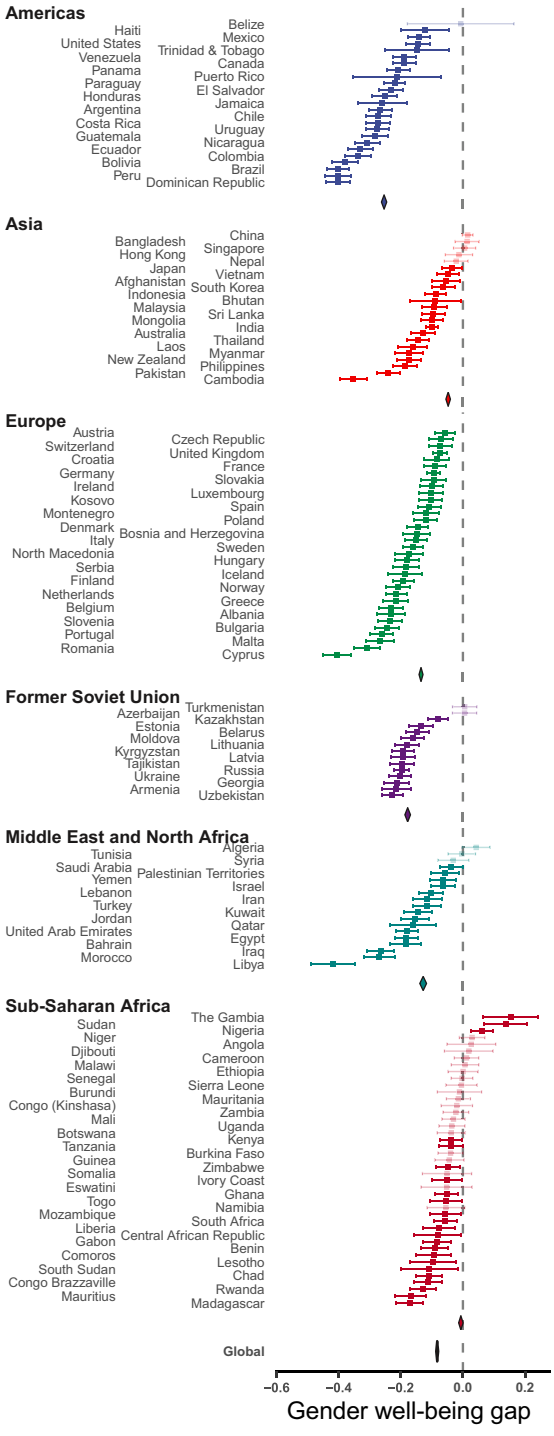

Fig. 2. Unadjusted gender gaps in negative affect across countries, world regions, and globally. The dots represent the gender coefficient from a multiple regression model for each country, with 95% confidence indicated by error bars (N = 2,562,000). Diamonds represent combined estimates for regions (colored) and globally (black), where the width of the diamond reflects the 95% CI. We reverse code negative affect so that positive estimates indicate that women have better outcomes (i.e., lower negative affect) than men for a given region. The vertical dashed line represents gender parity with respect to life evaluation, and faded bars indicate nonsignificant results. We base our estimates on Gallup World Poll data from 2006 to 2023, with dummy controls for survey wave. See the section "Illustration of the first paradox" for discussion.

cross-sectional gender well-being paradox (i.e., where both gaps are significant and of opposing signs) in only 59 of 164 countries.

In line with the literature, adjusting for covariates tends to render the gender gaps more positive (see figs. S1 to S4). This change is more pronounced for life evaluations than for negative affect. Thus, after adjusting for both socioeconomic and demographic covariates, we observe a statistically significant gender well-being paradox in all world regions except Sub-Saharan Africa. Yet, the between country-variance in estimated gaps does not reduce with these adjustments.

Gender gaps in positive affect and physical pain. Results on gender gaps in negative affect and physical pain are shown in figs. S5 and S6 (for models that control for covariates, see figs. S7 to S10). Physical pain tends to yield a negative gender gap, whereas the gender gap in positive affect is mixed, with the Americas being the only region where the gap is consistently negative. As with life evaluations and negative affect, the global and region-specific estimates, mask substantial differences in gender gaps across countries, even within world regions. In that sense, the specific country of residence matters more than the broader regional context. Last, figs. S11 to S14 explore whether the observed gaps are associated with the overall levels of well-being in each country. There is some evidence that, in countries with higher levels of well-being, the gender gaps tend to be both narrower and more favorable toward women.

Overview of findings. Overall, these illustrations yield three conclusions:

1) The gender well-being paradox is real but not universal. In the raw data, it is observed in 36% of countries, covering 32% of the population. Similar patterns have been documented in previous studies using these data (*22*, *24*, *64*).

2) Adjusting for covariates increases these figures to 51% of countries, covering 56% of the population. Although the paradox becomes more pronounced with these adjustments, this suggests that the observed patterns are not merely artifacts of model specification, as some previous studies on Europe have suggested [e.g., (*78*)].

3) Focusing on global gaps, or gaps specific to particular world regions, hides unexpectedly large differences across countries. This also implies that findings specific to any one country (such as the US) are unlikely to generalize across the world.

How well do current explanations in the literature address the gender well-being paradox? Although the reference standards explanation may help in understanding gender differences in life evaluation, it does not fully account for the complex patterns of well-being across different affect measures and regions. For example, in regions like the Middle East and North Africa and Asia, women report both higher positive affect and greater negative affect than men, suggesting that additional factors are likely influencing these outcomes. Cultural influences may play a role, particularly in contexts where men are socially conditioned to be more emotionally restrained, which could lead to underreporting of both positive and negative emotions. For instance, research has shown that fathers tend to reward girls and punish boys for expressing sadness and fear (*106*). Traditional gender roles might also contribute as women may derive positive affect from fulfilling culturally valued roles, such as caregiving, while also experiencing greater negative affect due to the associated stress and demands.

As we noted earlier, the literature also suggests that women may experience greater overall emotional intensity, with hormonal factors often cited as a reason for more extreme emotional highs and lows. If this were the case, we might expect women who report high

life satisfaction to report high levels of negative affect too. This would result in a weaker correlation between high life satisfaction and low negative affect for women compared to men as these intense emotions could coexist. Yet, as shown in Table 1, the within-person associations between outcome measures are not substantially different between genders. This suggests that women are not simultaneously experiencing both high life satisfaction and high negative affect. Instead, different women are reporting these outcomes. Therefore, the absence of clearly weaker correlations in women challenges the idea that women experience both positive and negative emotions more intensely at the same time. Therefore, although emotional intensity may play a role, it is also unlikely to be the sole explanation for the paradox.

THE LONGITUDINAL FEMALE WELL-BEING PARADOX

We now turn to the second paradox discussed in the literature. Women's economic standing has, across multiple metrics, improved relative to men. Since the 1990s, global women's labor force participation has increased by about 5 percentage points since the 1990s (*107*). In the US in particular, the gap in labor force participation, education levels, and wages has steadily decreased from the 1950s to the early 2000s (*1*, *108*). Similar trends exist in several European countries, including Germany, the UK, and France (*4*, *109*). Although women have historically been disadvantaged compared to men—and still face some inequalities—the gender gap in economic attainment has considerably narrowed worldwide. Given these economic gains, one might expect a corresponding improvement in women's well-being relative to men. Yet, some prominent studies have found the opposite: Despite closing the economic gap, women's well-being has declined relative to men's over the same period (*25*, *110*). This is, again, a paradox.

Longitudinal evidence on happiness and life satisfaction

The paradox was first observed in the US (but not the UK) (*110*). In the US, data on self-reported happiness from 1972 to 1998 indicated a negative trend in women's self-reported overall happiness, whereas men's happiness increased.

Subsequent studies confirmed this trend across multiple datasets, revealing that, although women were significantly happier in the 1970s, this gap had disappeared by the early 2000s (*25*). This trend was consistent across age groups, education levels, marital status, and employment status. The only exception was among Black men and women, both of whom experienced a steady rise in happiness, narrowing the well-being gap with white individuals, and with the trend being more positive among Black women than Black men. Gendered trends were also observed across most domain-specific measures of well-being (e.g., jobs, finances, leisure time, and friendships), with health satisfaction being the only exception. This relative fall in women's well-being occurred not only in the US but also in most European countries (*111*, *112*) and in global data (*113*).

Yet, a more recent work (*27*), using longer time series for the US, suggests that this trend may have stalled, or even reversed, since the early 2000s. This work provides evidence of a women-favoring trend in several European countries, especially the UK, during the early 21st century. Despite this, Gallup World Poll data indicate that women continue to experience worse time trends than men, although they remain more satisfied with life on average (*22*).

The abovementioned literature is largely based on single-item measures. However, some studies have used the day-reconstruction method (*114*), combining time-use data with activity-level happiness data. These studies have generally focused on the US. The earliest such work combined US activity-level happiness data from 2006 with time-use data covering the period between 1965 and 2003 (*115*) and showed that the rate at which negative emotions predominate within a given activity (the so-called "U-index") has been declining for men but remained constant for women. A subsequent work has shown that shifts in occupational choices led to consistent improvements in women's well-being at work between 1950 and 2015, both in absolute terms and relative to men (*116*). A recent study combined time-use and activity-level happiness data from across the 1980s, 2010s, and 2020s for both the US and the UK (*7*), showing a positive relative trend in women's "time-weighted" well-being up until the 2010s, primarily driven by reductions in hours of domestic work [cf. (*117*)]. However, the same research also documents a marked drop in women's time-weighted happiness during the 2020 pandemic year. Multiple studies consistently show that women's well-being and mental health were disproportionately affected by the COVID-19 pandemic, particularly during lockdown periods (*118*). These more substantial negative effects on women were not primarily driven by worse economic shocks but by much more pronounced impacts on loneliness (*119*, *120*).

Overall, the evidence for the longitudinal paradox in happiness and life satisfaction is less robust than is commonly believed and is weaker than the evidence for the cross-sectional paradox.

Table 1. Correlation matrix of life satisfaction, positive affect, negative affect, and pain, separated by gender. Correlations for men and women are shown side by side. Negative affect (3) and pain (4) are reverse scored, so higher values indicate better outcomes. All correlations are based on data from the Gallup World Poll (2006 to 2023).

	Men (N = 1,199,080)				Women (N = 1,362,898)			
	1.	2.	3.	4.	1.	2.	3.	4.
1. Life satisfaction	1				1			
2. Positive affect	0.243	1			0.239	1		
3. Negative affect	0.21	0.369	1		0.201	0.401	1	
4. Pain	0.176	0.227	0.305	1	0.198	0.272	0.331	1

Longitudinal evidence on mental health and pain

The evidence regarding mental health and pain trends is clearer. In the US, data from the nationwide Behavioral Risk Factor Surveillance System (BRFSS) study, covering 1993 to 2019, show a stark increase, of almost 50%, in the share of individuals with poor mental health (*121*). This rise was especially pronounced among women, whose share with very poor mental health increased from 4.1 to 7.0%, whereas men's share only increased from 3.2 to 5.3%. The sharpest increase for women occurred between 2015 and 2019.

We see similar trends in the UK. Psychological distress, as measured using the GHQ-12 (the 12-item General Health Questionnaire), was generally higher among women relative to men in the early 1990s. Although the gap narrowed until the 2008 economic crisis (*122*), it widened again during the recession and subsequent austerity period, with both genders experiencing a decline in mental health (*122*). This evidence is relatively consistent across age groups. Although there was no substantial change in the gender gap among 15 to 16 year olds in the UK between 1974 and 1999 (*123*), a negative trend in young women's (aged 16 to 24) mental health between 1991 and 2008 was noted, whereas young men's mental health improved (*124*). This trend is also mirrored in Swedish data for individuals aged 11 to 16, where increased school stress among girls is cited as a contributing factor (*125*).

Gendered trends have also been documented with respect to physical pain (*126*). In Gallup World Poll data, and pooling across countries, the share of individuals in pain increased from 26.3% in 2009 to 32.1% in 2021. Although, in higher-income countries, the growth in physical pain was equally fast among men and women, pain grew 11% faster among women than men in lower-income countries.

Overall, there is fairly clear evidence that women experienced worse time trends than men in both pain and mental health during the late 20th and early 21st centuries. However, much of the literature thus far has focused on the US and the UK.

Explanations

One potential explanation for the paradox is that women do not seem to benefit equally from economic and social progress. Research suggests that general economic growth does not necessarily translate into greater well-being for women compared to men (*65*). Although rarely statistically significant, there appears to be a small negative association between gross domestic product per capita and the gender gap favoring women in satisfaction (*24*, *26*). Moreover, improvements in societal conditions, such as education, health, and governance, tend to benefit men's well-being more than women's, often in a curvilinear pattern (*127*). In European countries, greater gender equality in economic and political, education, and health dimensions does not necessarily lead to higher well-being for women compared to men (*128*). Among boys and girls aged 15 in particular, greater gender equality tends to be beneficial for boys but bears no association with well-being among girls (*76*). Similarly, there appears to be a negative association between women's well-being (both absolute and relative to men) and the size of the gender wage gap (*129*). Although most of this evidence focuses on life satisfaction, similar gender gaps are also observed in self-reported happiness (*74*).

A second potential explanation relies on the idea of a "double burden" (*26*). Changes in women's economic standing and social roles increased women's workload from primarily domestic work to both market and domestic work. However, the previously cited evidence (*7*) from time-use surveys casts doubts on this mechanism. In the US, although the time women spent on market work has slightly increased since the 1980s, this has been offset by a reduction in time spent on domestic work (for men, the inverse has been observed). As a result, the total leisure time for American women has increased, not decreased, since the 1980s. Nevertheless, time-use trends alone may not fully capture the pressures of the double burden. Although the hours women spend on domestic work have decreased, the societal expectation that they should hold primary responsibility for care and household tasks may not have diminished to the same extent. Multiple studies have shown that more pronounced conflicts between market and domestic work are associated with lower well-being, especially among women (*98*, *100*, *130*). In Europe, for instance, data indicate that, in countries with greater gender equality and progressive norms, women report more frequent work-family conflicts, leading to reduced overall positive affect (*98*). Although these findings are not gender disaggregated, it is plausible that the associations are primarily driven by women.

A third, related, explanation more directly focuses on evolving expectations among women (*25*). As discussed earlier, people often assess life satisfaction (and, to a lesser extent, overall happiness) relative to reference standards. As social attitudes toward women evolved, particularly during the 1970s and 1980s (*131*), these reference standards may have shifted closer to those of men. If women's aspirations and benchmarks for success rose in response to the changing norms, any absolute gains in happiness and life satisfaction could be masked—or even offset—by these rising expectations.

In this context, it is noteworthy that, as discussed previously, African American women derived greater levels of happiness from work than white women in the US in the 1980s (*95*) and saw a much more positive overtime trend in happiness since that time (*25*). This exception may reflect distinct cultural or socioeconomic influences that shaped their expectations and sense of satisfaction differently.

Nevertheless, this mechanism of rising expectations does not explain the negative trends in women's mental health and reported levels of pain as these areas are less likely to be directly influenced by shifts in personal aspiration and changing social expectations about women's roles.

Illustration of the second paradox

Data

We use three datasets to illustrate the longitudinal gender well-being paradox. First, we use the same global Gallup World Poll to show time trends from 2006 to 2023. Second, we use data from the US GSS covering the period from 1972 to 2022. Third, we use Eurobarometer data for several major European countries, spanning from 1974 to 2023.

For the Gallup World Poll, we use the same outcome measures as previously described. In the GSS, we focus on responses to the question, "Taken all together, how would you say things are these days—would you say that you are very happy, pretty happy, or not too happy?" We code responses on a scale between 1 and 3 (see tables S3 and S4 for GSS and Eurobarometer summary statistics). We also show trends for financial satisfaction, job satisfaction, and excitement about life (the latter of which appears to be underexplored in previous research). For the Eurobarometer, we analyze life satisfaction data (using the question, "On the whole, are you very satisfied,

fairly satisfied, not very satisfied, or not at all satisfied with the life you lead?") with responses scored on a 1 to 4 scale.

Results

We begin with time trends in life evaluation and negative affect across countries and world regions using Gallup data. Figures 3 and 4 illustrate these trends, showing the "raw" unadjusted gender gaps in these outcomes. Equivalent graphs adjusted for socioeconomic and demographic covariates are shown in figs. S15 to S18. The thick colored lines represent the average gender gap across world regions [with the shaded areas indicating 95% confidence intervals (CIs)]. For life evaluation, the trends are relatively flat with minor fluctuations, showing no marked or consistent changes over the past 17 years (Fig. 3). In contrast, clear negative trends are visible for negative affect, especially over the past decade. Europe is the only region where the gap has consistently narrowed (Fig. 4).

Regional and global gender gap trends. To test the longitudinal paradox formally, we estimated linear time trends in each world region. For life evaluation, these regional trends are statistically significant in four of the six world regions. Only Europe shows a significantly negative trend. In contrast, for negative affect, the trends are more pronounced, always statistically significant across all regions, and typically negative. Europe again is the exception, now showing a significant positive trend in negative affect, compared to significant negative trends in the gender gap across all other world regions. For negative affect, time trends are significant and positive in Europe but significantly negative in the Americas, Asia, and Sub-Saharan Africa (figs. S19 to S21). Regarding physical pain, time trends are negative and significant in all world regions (figs. S22 to S24).

Hence, although the global evidence on longitudinal trends in evaluative well-being is less conclusive, it is clear that, in many countries, women are faring worse relative to men in terms of negative affect and physical pain. Therefore, the first paradox—women doing better in life evaluations but worse in negative affect and pain—appears to be becoming more pronounced over time.

Variation across countries. As with the first paradox discussed in the section "The cross-sectional female well-being paradox," this evidence is not universally applicable across all countries. The gray lines in Figs. 3 and 4 make this point more clear. There is substantial cross-country variation in both levels and trends of the gender gap. From year to year, the size of the gender gap can vary substantially within countries. When testing for linear time trends in gender gaps for life evaluation across individual countries, we observe significantly negative (positive) trends in only 12/159 (40/159) countries. For negative affect, the corresponding figures are significant negative trends in 40 countries and significant positive trends in 21 countries.

Despite this strong cross-country variation, it is nevertheless valuable to investigate whether these trends (or their absence) are a recent phenomenon or reflective of much more long-running developments. Figure 5 addresses this question, showing year-to-year trends in overall happiness for the US and in life satisfaction for several European countries (France, Belgium, The Netherlands, West Germany, Italy, Denmark, Ireland, and UK; see fig. S25 for models controlling for covariates and figs. S26 and S27 for models showing estimates for men and women separately).

In the US, the gender gap in happiness is insignificant in every individual year. However, when pooling data across years, a statistically significant gap of 0.015 (95% CI: 0.004 to 0.027) emerges. Concerning the evolution of this gap, although there is a small trend, it is neither visually notable nor sustained over the long term. Nevertheless, a significance test for a linear time trend across the entire observed period yields a marginally significant negative estimate. Overall, this indicates a slight relative decline in female happiness primarily between the 1970s and early 2000s, as previously documented (*25*, *110*). Moreover, figs. S28 and S29 show largely trendless fluctuations in gender gaps related to job satisfaction and feelings of excitement about life. The only consistent long-term trend is a relative decline in women's financial satisfaction throughout the observed period.

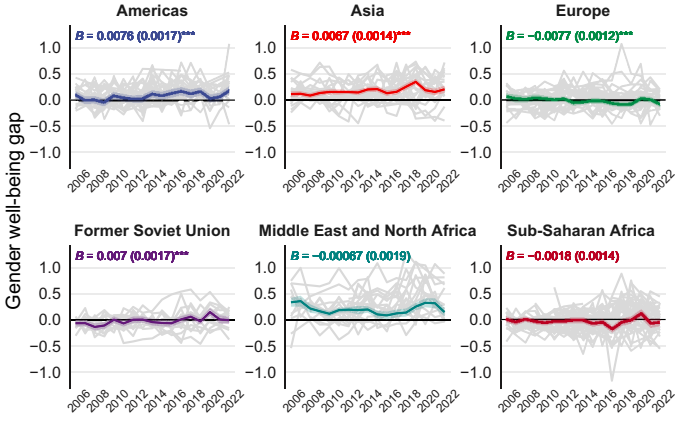

Fig. 3. Change in gender gap in life evaluations across countries and world regions. Light gray lines represent estimates of the interaction between the female variable and year dummies for each country within a given region. The colored line represents the interaction for the entire region, with the shaded ribbon indicating the 95% CI. The black horizontal line denotes gender parity (i.e., no gender difference). Each panel reports the coefficient and SE (in parentheses) for the respective region. For country-level time trends, see table S5. We base our estimates on Gallup World Poll data from 2006 to 2023.

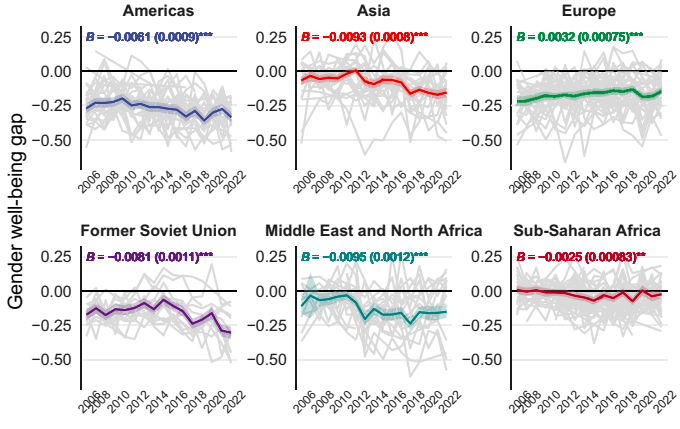

Fig. 4. Change in gender gap in negative affect across countries and world regions. Light gray lines represent estimates of the interaction between the female variable and year dummies for each country within a given region. The colored line represents the interaction for the entire region, with the shaded ribbon indicating the 95% CI. The black horizontal line denotes gender parity (i.e., no gender difference). Each panel reports the coefficient and SE (in parentheses) for the respective region. For country-level time trends, see table S6. We base our estimates on Gallup World Poll data from 2006 to 2023.

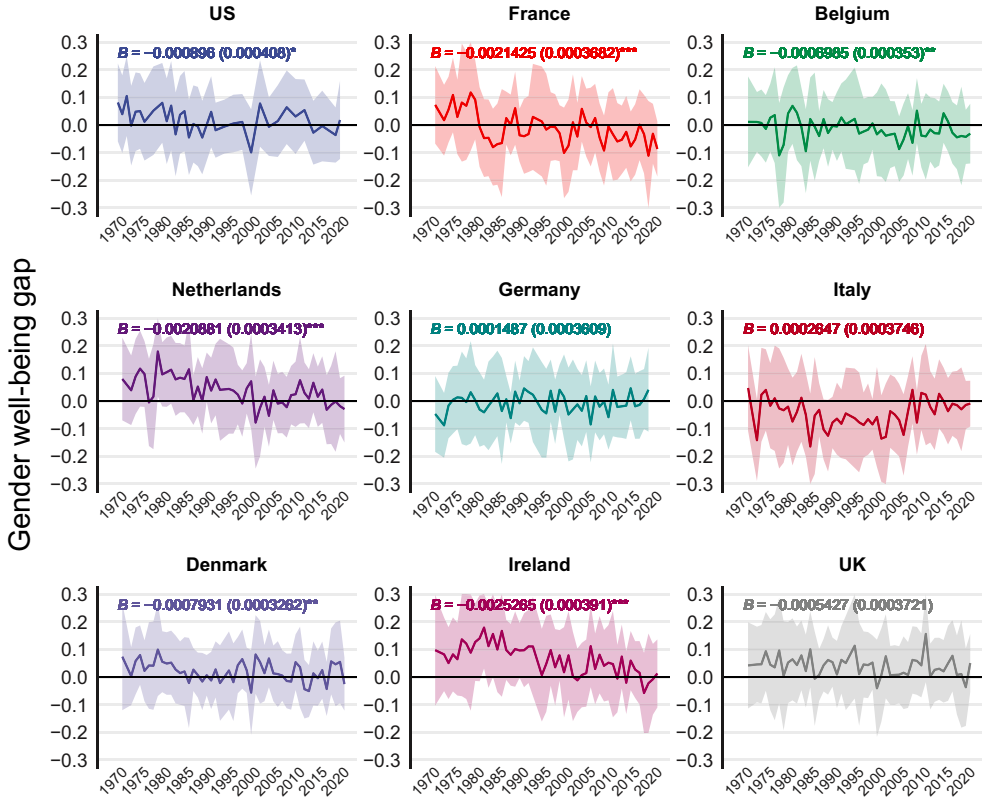

Fig. 5. Change in gender gap in overall happiness and life satisfaction in the US and several European countries. Colored lines represent estimates of the interaction between the female variable and year dummies for each country, with the shaded ribbon indicating the 95% CI. The black horizontal line denotes gender parity (i.e., no gender difference). Each panel reports the coefficient and SE (in parentheses) for the respective country. We base our estimates on the GSS from 1972 to 2023 (US) and Eurobarometer from 1973 to 2023 (Europe).

Similar patterns are found in the major European countries for which long-run data are available. In each of these countries, the gender gap is statistically insignificant in individual years. However, when pooling across all years, significant (at the 5% level) positive gaps are found in some countries (UK, Ireland, Denmark, and The Netherlands), whereas significant negative gaps are observed in others (Italy and Belgium). With the exception of The Netherlands, this is broadly in line with the results based on Gallup data shown earlier. The trends are generally small and dominated by year-to-year fluctuations, although negative trends are noticeable in most countries. In France, Belgium, The Netherlands, Denmark, and Ireland, we find small but statistically significant negative time trends, primarily driven by a relative decline in women's satisfaction between the 1970s and early 2000s.

Overview of findings. Thus, we draw three conclusions from these empirical illustrations:

1) If understood as referring to a secular decline in women's relative evaluative well-being, the paradox is again not universal. These trends are generally small and overshadowed by year-to-year fluctuations and cross-country variability.

2) In terms of negative affect and physical pain, women's relative well-being has significantly fallen across all world regions. Here, the longitudinal paradox appears more consistent. The more pronounced fall in these domains (compared to life evaluation) suggests that the first paradox—where women score better in life evaluations but worse in negative affect and pain—has become more pronounced over the past 17 years.

3) Where long-run data since the 1970s are available, we see a relative decline in women's evaluative well-being in both the US and most of the European countries. However, these trends are generally modest.

It remains unclear whether, as suggested in the literature, women's changing expectations can explain these negative trends. On the one hand, it is the case that, for the US and several European countries, most of the decline in women's well-being relative to men occurred during the latter third of the 20th century—the same period during which women's economic and social standing was most drastically transformed. On the other hand, more recent trends in the 21st century are primarily centered around trends in negative affect and physical pain, and changes in reference standards are much less likely to influence these measures. Moreover, adjusting for socioeconomic covariates, including income and employment status, has little effect on the observed trends (see figs. S15 to S29).

FINAL REMARKS AND FUTURE RESEARCH

In reviewing the literature, we identified two paradoxes in women's well-being. The first paradox highlights a seeming contradiction: Although women consistently report higher life evaluations and happiness, they also experience significantly worse outcomes in mental health, negative affect, and physical pain. This suggests that

evaluative indicators of well-being overlook gender-specific challenges that women face. The second paradox is that, despite the notable advancements in women's societal and economic conditions, such as higher labor force participation and educational attainment, women's subjective well-being has not improved to the same extent, particularly in terms of negative affect and physical pain. These findings underscore the need for gender-sensitive policies that not only focus on economic equality but also address mental health, emotional well-being, and physical pain management.

The research to date suggests three main mechanisms to explain the first paradox: (i) women's greater tendency to experience both positive and negative emotions more intensely; (ii) lower expectations among women compared to men, as well as cultural norms that restrain men from expressing their emotions; and (iii) differences in how men and women use response scales. Although these gender well-being paradoxes have been widely discussed, our empirical analysis shows that their manifestation is highly context dependent, with substantial cross-country variation. For example, in some countries like South Korea, women report higher life evaluations but worse negative affect, whereas in others, like Hungary, women fare worse in both domains. This variation suggests that cultural, social, and political contexts are crucial in shaping gender disparities, and universal explanations may oversimplify these complex issues.

When examining trends in gender well-being gaps, the evidence for a decline in women's evaluative well-being is inconsistent and generally modest. However, the declines in women's relative well-being regarding physical pain and negative affect are more pronounced and concerning, as highlighted by both the literature and our findings.

Where should the literature go from here? We see three particularly fruitful potential avenues. First, the roles of expectations, reference standards, and scale-use differences in explaining these paradoxes should be systematically explored on a global scale. This would require comprehensive global data on how different populations use reference standards in both affective and evaluative assessments. Second, the substantial variation in gender gaps across and within regions demands further investigation. On the basis of the literature, it seems that traditional explanations, such as those based on economic development or gender (in)equality in formal economic and political rights, will not be able to account for this complexity. Instead, it seems more likely that approaches rooted in cross-country variation in informal gender attitudes and roles (and their causes) would be more suitable for this task. Third, rather than relying on repeated cross sections, future work should make greater use of longitudinal panel datasets. This would allow us to improve our understanding of the temporal dynamics of these well-being gaps and to trace how gaps evolve within persons and households, how life events influence them, and the extent to which they are driven by age, period, or cohort differences.

The paradoxes in women's well-being emphasize the complexity of gender disparities and the necessity of interdisciplinary research. Future research will benefit from integrating insights from both the social and life sciences to explain how societal expectations, biological factors, and cultural norms interact to produce the varied gender gaps that we observe.

Supplementary Materials

This PDF file includes:

Figs. S1 to S29
Tables S1 to S8

REFERENCES AND NOTES

1. F. D. Blau, L. M. Kahn, The gender wage gap: Extent, trends, and explanations. *J. Econ. Lit.* **55**, 789–865 (2017).
2. R. H. Oostendorp, Globalization and the gender wage gap. *World Bank Econ. Rev.* **23**, 141–161 (2009).
3. A. Kunze, *The Oxford Handbook of Women and the Economy*, S. L. Averett, L. M. Argys, S. D. Hoffman, Eds. (Oxford Univ. Press, 2018), pp. 369–394.
4. B. Petrongolo, M. Ronchi, Gender gaps and the structure of local labor markets. *Lab. Econ.* **64**, 101819 (2020).
5. K. Weisshaar, T. Cabello-Hutt, Labor force participation over the life course: The long-term effects of employment trajectories on wages and the gendered payoff to employment. *Demography* **57**, 33–60 (2020).
6. S. Klasen, What explains uneven female labor force participation levels and trends in developing countries? *World Bank Res. Observ.* **34**, 161–197 (2019).
7. J. Han, C. Kaiser, Time use and happiness: US evidence across three decades. *J. Popul. Econ.* **37**, 15 (2024).
8. J. Swinkels, T. v. Tilburg, E. Verbakel, M. Broese van Groenou, Explaining the gender gap in the caregiving burden of partner caregivers. *J. Gerontol. B Psychol. Sci. Soc. Sci.* **74**, 309–317 (2019).
9. J. E. Yavorsky, C. M. Kamp Dush, S. J. Schoppe-Sullivan, The production of inequality: The gender division of labor across the transition to parenthood. *J. Marriage Fam.* **77**, 662–679 (2015).
10. P. M. Lersch, M. Jacob, K. Hank, Parenthood, gender, and personal wealth. *Eur. Sociol. Rev.* **33**, 410–422 (2017).
11. N. Waitkus, L. Minkus, Investigating the gender wealth gap across occupational classes. *Fem. Econ.* **27**, 114–147 (2021).
12. E. Ruel, R. M. Hauser, Explaining the gender wealth gap. *Demography* **50**, 1155–1176 (2013).
13. N. Frémeaux, M. Leturcq, Inequalities and the individualization of wealth. *J. Public Econ.* **184**, 104145 (2020).
14. J. Preece, O. Stoddard, Why women don't run: Experimental evidence on gender differences in political competition aversion. *J. Econ. Behav. Organ.* **117**, 296–308 (2015).
15. K. Kanthak, J. Woon, Women don't run? Election aversion and candidate entry. *Am. J. Politiclal Sci.* **59**, 595–612 (2015).
16. A. R. Miller, *The Oxford Handbook of Women and the Economy*, S. L. Averett, L. M. Argys, S. D. Hoffman, Eds. (Oxford Univ. Press, 2018), pp. 539–560.
17. O. Folke, J. Rickne, Sexual harassment and gender inequality in the labor market. *Q. J. Econ.* **137**, 2163–2212 (2022).
18. S. Otterbach, A. Sousa-Poza, X. Zhang, Gender differences in perceived workplace harassment and gender egalitarianism: A comparative cross-national analysis. *Bus. Ethics Environ. Responsib.* **30**, 392–411 (2021).
19. N. Matteucci, S. Vieira Lima, *Handbook of Research Methods and Applications in Happiness and Quality of Life*, L. Bruni, P. L. Porta, Eds. (Edward Elgar Publishing, 2016), pp. 419–447.
20. C. Batz, L. Tay, *Handbook of Well-Being*, E. Diener, S. Oishi, L. Tay, Eds. (DEF Publishers, 2018), pp. 1–15.
21. OECD, OECD Guidelines on Measuring Subjective Well-Being (OECD Publishing, 2013).
22. D. Blanchflower, A. Bryson, The gender well-being gap. *Soc. Indic. Res.* **173**, 1–45 (2024).
23. N. Fortin, J. Helliwell, S. Wang, "How does subjective wellbeing vary around the world by gender and age" in *World Happiness Report 2015* (Sustainable Development Solutions Network, 2015).
24. J. S. Zweig, Are women happier than men? Evidence from the Gallup World Poll. *J. Happiness Stud.* **16**, 515–541 (2015).
25. B. Stevenson, J. Wolfers, The paradox of declining female happiness. *Am. Econ. J. Econ. Policy* **1**, 190–225 (2009).
26. C. Graham, S. Chattopadhyay, Gender and well-being around the world. *Int. J. Happiness Dev.* **1**, 212 (2013).
27. D. G. Blanchflower, A. Bryson, The female happiness paradox. *J. Popul. Econ.* **37**, 16 (2024).
28. L. Becchetti, G. Conzo, The gender life satisfaction/depression paradox. *Soc. Indic. Res.* **160**, 35–113 (2022).
29. C. Senik, Gender gaps in subjective wellbeing: A new paradox to explore. *Rev. Behav. Econ.* **4**, 349–369 (2017).
30. T. Boerma, A. R. Hosseinpoor, E. Verdes, S. Chatterji, A global assessment of the gender gap in self-reported health with survey data from 59 countries. *BMC Public Health* **16**, 675 (2016).
31. J. S. Hyde, A. H. Mezulis, L. Y. Abramson, The ABCs of depression: Integrating affective, biological, and cognitive models to explain the emergence of the gender difference in depression. *Psychol. Rev.* **115**, 291–313 (2008).
32. R. Kessler, Epidemiology of women and depression. *J. Affect. Disord.* **74**, 5–13 (2003).
33. D. G. Blanchflower, A. J. Oswald, Antidepressants and age: A new form of evidence for u-shaped well-being through life. *J. Econ. Behav. Organ.* **127**, 46–58 (2016).

34. M. Piccinelli, G. Wilkinson, Gender differences in depression: Critical review. *Br. J. Psychiatry* **177**, 486–492 (2000).
35. S. Nolen-Hoeksema, Gender differences in depression. *Curr. Dir. Psychol. Sci.* **10**, 173–176 (2001).
36. S. Gore, R. H. Aseltine Jr., M. E. Colten, Gender, social-relationship involvement, and depression. *J. Adolesc. Res.* **3**, 101–125 (1993).
37. I. Sandanger, J. F. Nygård, T. Sørensen, T. Moum, Is women's mental health more susceptible than men's to the influence of surrounding stress? *Soc. Psychiatry Psychiatr. Epidemiol.* **39**, 177–184 (2004).
38. M. P. Matud, Gender differences in stress and coping styles. *Pers. Individ. Differ.* **37**, 1401–1415 (2004).
39. W. Wood, A. H. Eagly, *Advances in Experimental Social Psychology*, J. M. Olson, M. P. Zanna, Eds. (Academic Press, 2012), vol. 46, pp. 55–123.
40. A. Kågesten, S. Gibbs, R. W. Blum, C. Moreau, V. Chandra-Mouli, A. Herbert, A. Amin, Understanding factors that shape gender attitudes in early adolescence globally: A mixed-methods systematic review. *PLOS ONE* **11**, e0157805 (2016).
41. M. E. Addis, Gender and depression in men. *Clin. Psychol. Sci. Pract.* **15**, 153–168 (2008).
42. A. Tintori, G. Ciancimino, R. Palomba, C. Clementi, L. Cerbara, The impact of socialisation on children's prosocial behaviour. A study on primary school students. *Int. J. Environ. Res. Public Health* **18**, 12017 (2021).
43. L. R. Brody, J. A. Hall, *Handbook of Emotions*, M. Lewis, J. M. Haviland-Jones, L. F. Barrett, Eds. (The Guilford Press, ed. 3, 2008), pp. 395–408.
44. D. P. Johnson, M. A. Whisman, Gender differences in rumination: A meta-analysis. *Pers. Individ. Differ.* **55**, 367–374 (2013).
45. W. Treynor, Rumination reconsidered: A psychometric analysis. *Cogn. Ther. Res.* **27**, 247–259 (2003).
46. S. Nolen-Hoeksema, B. Jackson, Mediators of the gender difference in rumination. *Psychol. Women Q.* **25**, 37–47 (2001).
47. M. Altemus, Sex differences in depression and anxiety disorders: Potential biological determinants. *Horm. Behav.* **50**, 534–538 (2006).
48. R. S. Eid, A. R. Gobinath, L. A. M. Galea, Sex differences in depression: Insights from clinical and preclinical studies. *Prog. Neurobiol.* **176**, 86–102 (2019).
49. J. M. Andreano, A. Touroutoglou, B. Dickerson, L. F. Barrett, Hormonal cycles, brain network connectivity, and windows of vulnerability to affective disorder. *Trends Neurosci.* **41**, 660–676 (2018).
50. P. Patalay, E. Fitzsimons, Development and predictors of mental ill-health and wellbeing from childhood to adolescence. *Soc. Psychiatry Psychiatr. Epidemiol.* **53**, 1311–1323 (2018).
51. H. M. Kravitz, A. B. Colvin, N. E. Avis, H. Joffe, Y. Chen, J. T. Bromberger, Risk of high depressive symptoms after the final menstrual period: The Study of Women's Health Across the Nation (SWAN). *Menopause* **29**, 805–815 (2022).
52. V. K. Burt, K. Stein, Epidemiology of depression throughout the female life cycle. *J. Clin. Psychiatry* **63**, 9–15 (2002).
53. R. E. Noble, Depression in women. *Metabolism* **54**, 49–52 (2005).
54. H. Chen, D. S. Pine, M. Ernst, E. Gorodetsky, S. Kasen, K. Gordon, D. Goldman, P. Cohen, The MAOA gene predicts happiness in women. *Prog. Neuropsochopharmacol. Biol. Psychiatry* **40**, 122–125 (2013).
55. R. Siracusa, R. D. Paola, S. Cuzzocrea, D. Impellizzeri, Fibromyalgia: Pathogenesis, mechanisms, diagnosis and treatment options update. *Int. J. Mol. Sci.* **22**, 3891 (2021).
56. K. G. Vetvik, E. A. MacGregor, Sex differences in the epidemiology, clinical features, and pathophysiology of migraine. *Lancet Neurol.* **16**, 76–87 (2017).
57. B. S. Schwartz, Epidemiology of tension-type headache. *JAMA* **279**, 381 (1998).
58. R. M. Lovell, A. C. Ford, Effect of gender on prevalence of irritable bowel syndrome in the community: Systematic review and meta-analysis. *Am. J. Gastroenterol.* **107**, 991–1000 (2012).
59. C. H. Bueno, D. D. Pereira, M. P. Pattussi, P. K. Grossi, M. L. Grossi, Gender differences in temporomandibular disorders in adult populational studies: A systematic review and meta-analysis. *J. Oral Rehabil.* **45**, 720–729 (2018).
60. J. B. Forrest, S. Schmidt, Interstitial cystitis, chronic nonbacterial prostatitis and chronic pelvic pain syndrome in men: A common and frequently identical clinical entity. *J. Urol.* **172**, 2561–2562 (2004).
61. E. J. Bartley, R. B. Fillingim, Sex differences in pain: A brief review of clinical and experimental findings. *Br. J. Anaesth.* **111**, 52–58 (2013).
62. A. Todd, C. L. McNamara, M. Balaj, T. Huijts, N. Akhter, K. Thomson, A. Kasim, T. A. Eikemo, C. Bambra, The European epidemic: Pain prevalence and socioeconomic inequalities in pain across 19 European countries. *Eur. J. Pain* **23**, 1425–1436 (2019).
63. L. Macchia, A. J. Oswald, Physical pain, gender, and the state of the economy in 146 nations. *Soc. Sci. Med.* **287**, 114332 (2021).
64. M. Joshanloo, V. Jovanović, The relationship between gender and life satisfaction: Analysis across demographic groups and global regions. *Arch. Womens Ment. Health* **23**, 331–338 (2020).
65. M. L. Arrosa, N. Gandelman, Happiness decomposition: Female optimism. *J. Happiness Stud.* **17**, 731–756 (2016).
66. D. G. Blanchflower, A. J. Oswald, International happiness: A new view on the measure of performance. *Acad. Manag. Perspect.* **25**, 6–22 (2011).
67. R. Inglehart, Gender, aging, and subjective well-being. *Int. J. Comp. Sociol.* **43**, 391–408 (2002).
68. L. Tay, V. Ng, L. Kuykendall, E. Diener, *Research in Occupational Stress and Well-Being*, P. L. Perrewé, C. C. Rosen, J. R. B. Halbesleben, Eds. (Emerald Group Publishing Limited, 2014), vol. 12, pp. 235–283.
69. A. E. Clark, Job satisfaction and gender: Why are women so happy at work? *Lab. Econ.* **4**, 341–372 (1997).
70. C. Pita, R. J. Torregrosa, The gender-job satisfaction paradox through time and countries. *Appl. Econ.* **28**, 1000–1005 (2021).
71. E. Diener, E. M. Suh, R. E. Lucas, H. L. Smith, Subjective well-being: Three decades of progress. *Psychol. Bull.* **125**, 276–302 (1999).
72. F. Fujita, E. Diener, E. Sandvik, Gender differences in negative affect and well-being: The case for emotional intensity. *J. Pers. Soc. Psychol.* **61**, 427–434 (1991).
73. J. Brebner, Gender and emotions. *Pers. Individ. Differ.* **34**, 387–394 (2003).
74. G. Meisenberg, M. A. Woodley, Gender differences in subjective well-being and their relationships with gender equality. *J. Happiness Stud.* **16**, 1539–1555 (2015).
75. D. G. Blanchflower, A. Bryson, Seasonality and the female happiness paradox. *Qual. Quan.* **58**, 1–33 (2024).
76. J. Guo, G. Basarkod, F. Perales, P. D. Parker, H. W. Marsh, J. Donald, T. Dicke, B. K. Sahdra, J. Ciarrochi, X. Hu, C. Lonsdale, T. Sanders, B. del Pozo Cruz, The equality paradox: Gender equality intensifies male advantages in adolescent subjective well-being. *Pers. Soc. Psychol. Bull.* **50**, 147–164 (2024).
77. O. L. Campbell, D. Bann, P. Patalay, The gender gap in adolescent mental health: A cross-national investigation of 566,829 adolescents across 73 countries. *SSM Popul. Health* **13**, 100742 (2021).
78. D. Bartram, The 'gender life-satisfaction/depression paradox' is an artefact of inappropriate control variables. *Soc. Indic. Res.* **164**, 1061–1072 (2022).
79. C. Batz-Barbarich, L. Tay, L. Kuykendall, H. K. Cheung, A meta-analysis of gender differences in subjective well-being: Estimating effect sizes and associations with gender inequality. *Psychol. Sci.* **29**, 1491–1503 (2018).
80. P. A. Linley, H. Dovey, S. Beaumont, J. Wilkinson, R. Hurling, Examining the intensity and frequency of experience of discrete positive emotions. *J. Happiness Stud.* **17**, 875–892 (2016).
81. I. Poláčková Šolcová, A. Lačev, Differences in male and female subjective experience and physiological reactions to emotional stimuli. *Int. J. Psychophysiol.* **117**, 75–82 (2017).
82. M. Grossman, W. Wood, Sex differences in intensity of emotional experience: A social role interpretation. *J. Pers. Soc. Psychol.* **65**, 1010–1022 (1993).
83. F. B. Bryant, P. R. Yarnold, L. G. Grimm, Toward a measurement model of the affect intensity measure: A three-factor structure. *J. Res. Pers.* **30**, 223–247 (1996).
84. M. M. Kelly, A. R. Tyrka, G. M. Anderson, L. H. Price, L. L. Carpenter, Sex differences in emotional and physiological responses to the Trier Social Stress Test. *J. Behav. Ther. Exp. Psychiatry* **39**, 87–98 (2008).
85. A. Hofer, C. M. Siedentopf, A. Ischebeck, M. A. Rettenbacher, M. Verius, S. Felber, W. W. Fleischhacker, Gender differences in regional cerebral activity during the perception of emotion: A functional MRI study. *Neuroimage* **32**, 854–862 (2006).
86. G. Domes, L. Schulze, M. Böttger, A. Grossmann, K. Hauenstein, P. H. Wirtz, M. Heinrichs, S. C. Herpertz, The neural correlates of sex differences in emotional reactivity and emotion regulation. *Hum. Brain Mapp.* **31**, 758 (2010).
87. J. S. Stevens, S. Hamann, Sex differences in brain activation to emotional stimuli: A meta-analysis of neuroimaging studies. *Neuropsychologia* **50**, 1578–1593 (2012).
88. A. Fernandes, M. Huber, G. Vaccaro, Gender differences in wage expectations. *PLOS ONE* **16**, e0250892 (2021).
89. C. Bonnard, J.-F. Giret, Gender differences in French undergraduates' academic plans and wage expectations. *Gend. Educ.* **28**, 581–598 (2016).
90. L. Hauret, D. R. Williams, Cross-national analysis of gender differences in job satisfaction. *Ind. Relat. J. Econ. Soc.* **56**, 203–235 (2017).
91. C. Senik, When information dominates comparison. *J. Public Econ.* **88**, 2099–2123 (2004).
92. C. Tesch-Römer, A. Motel-Klingebiel, M. J. Tomasik, Gender differences in subjective well-being: Comparing societies with respect to gender equality. *Soc. Ind. Res.* **85**, 329 (2008).
93. S. Dreger, T. Gerlinger, G. Bolte, Gender inequalities in mental wellbeing in 26 European countries: Do welfare regimes matter? *Eur. J. Public Health* **26**, 872–876 (2016).
94. I. Cortès-Franch, V. Puig-Barrachina, H. Vargas-Leguás, M. M. Arcas, L. Artazcoz, Is being employed always better for mental wellbeing than being unemployed? Exploring the role of gender and welfare state regimes during the economic crisis. *Int. J. Environ. Res. Public Health* **16**, 4799 (2019).
95. R. P. Burton, D. A. Armstrong, B. Rushing, Social roles and subjective well-being: A decomposition of race differences. *Sociol. Spectr.* **13**, 415 (1993).
96. H. Sweeting, A. Bhaskar, M. Benzeval, F. Popham, K. Hunt, Changing gender roles and attitudes and their implications for well-being around the new millennium. *Soc. Psychiatry Psychiatr. Epidemiol.* **49**, 791–809 (2014).

97. T. de Hoop, L. van Kempen, R. Linssen, A. van Eerdewijk, Women's autonomy and subjective well-being: How gender norms shape the impact of self-help groups in Odisha, India. *Fem. Econ.* **20**, 103 (2014).
98. E. Hagqvist, K. G. Gådin, M. Nordenmark, Work-family conflict and well-being across europe: The role of gender context. *Soc. Ind. Res.* **132**, 785–797 (2017).
99. J. Annan, A. Donald, M. Goldstein, P. Gonzalez Martinez, G. Koolwal, Taking power: Women's empowerment and household well-being in Sub-Saharan Africa. *World Dev.* **140**, 105292 (2021).
100. D. Gjerdingen, P. McGovern, M. Bekker, U. Lundberg, T. Willemsen, Women's work roles and their impact on health, well-being, and career: Comparisons between the United States, Sweden, and The Netherlands. *Women Health* **31**, 1–20 (2001).
101. D. J. Benjamin, J. Debnam Guzman, M. Fleurbaey, O. Heffetz, M. Kimball, What do happiness data mean? Theory and survey evidence. *J. Eur. Econ. Assoc.* **21**, 2377–2412 (2023).
102. E. Fumagalli, L. Fumagalli, Subjective well-being and the gender composition of the reference group: Evidence from a survey experiment. *J. Econ. Behav. Organ.* **194**, 196–219 (2022).
103. E. Oparina, S. Srisuma, Analyzing subjective well-being data with misclassification. *J. Bus. Econ. Stat.* **40**, 730–743 (2022).
104. V. Angelini, D. Cavapozzi, L. Corazzini, O. Paccagnella, Do Danes and Italians rate life satisfaction in the same way? Using vignettes to correct for individual-specific scale biases. *Oxf. Bull. Econ. Stat.* **76**, 643–666 (2014).
105. M. Montgomery, Reversing the gender gap in happiness. *J. Econ. Behav. Organ.* **196**, 65–78 (2022).
106. R. B. Garside, B. Klimes-Dougan, Socialization of discrete negative emotions: Gender differences and links with psychological distress. *Sex Roles* **47**, 115–128 (2002).
107. M. Bertrand, Gender in the twenty-first century. *AEA Pap. Proc.* **110**, 1–24 (2020).
108. P. England, A. Levine, E. Mishel, Progress toward gender equality in the United States has slowed or stalled. *Proc. Natl. Acad. Sci. U.S.A.* **117**, 6990–6997 (2020).
109. F. Busch, Gender segregation, occupational sorting, and growth of wage disparities between women. *Demography* **57**, 1063–1088 (2020).
110. D. G. Blanchflower, A. J. Oswald, Well-being over time in Britain and the USA. *J. Public Econ.* **88**, 1359–1386 (2004).
111. E. Eckermann, Ed., Gender, Lifespan and Quality of Life: An International Perspective, vol. 53 of Social Indicators Research Series (Springer, 2014).
112. A. Sousa-Poza, A. A. Sousa-Poza, Gender differences in job satisfaction in Great Britain, 1991-2000: Permanent or transitory? *Appl. Econ. Lett.* **10**, 691–694 (2003).
113. M. Mikucka, The life satisfaction advantage of being married and gender specialization. *J. Marriage Fam.* **78**, 759–779 (2016).
114. D. Kahneman, A. B. Krueger, D. A. Schkade, N. Schwarz, A. A. Stone, A survey method for characterizing daily life experience: The day reconstruction method. *Science* **306**, 1776–1780 (2004).
115. A. B. Krueger, Are we having more fun yet? Categorizing and evaluating changes in time allocation. *Brookings Pap. Econ. Act.* **2007**, 193–215 (2007).
116. G. Kaplan, S. Schulhofer-Wohl, The changing (dis-)utility of work. *J. Econ. Perspect.* **32**, 239–258 (2018).
117. M. Aguiar, E. Hurst, Measuring trends in leisure: The allocation of time over five decades. *Q. J. Econ.* **122**, 969–1006 (2007).
118. A. Adams-Prassl, T. Boneva, M. Golin, C. Rauh, The impact of the coronavirus lockdown on mental health: Evidence from the United States. *Econ. Policy* **37**, 139–155 (2022).
119. B. Etheridge, L. Spantig, The gender gap in mental well-being at the onset of the Covid-19 pandemic: Evidence from the UK. *Eur. Econ. Rev.* **145**, 104114 (2022).
120. A. Lepinteur, A. E. Clark, A. Ferrer-i-Carbonell, A. Piper, C. Schröder, C. D'Ambrosio, Gender, loneliness and happiness during COVID-19. *J. Behav. Exp. Econ.* **101**, 101952 (2022).
121. D. G. Blanchflower, A. J. Oswald, Trends in extreme distress in the United States, 1993-2019. *Am. J. Public Health* **110**, 1538–1544 (2020).
122. R. M. Thomson, S. V. Katikireddi, Mental health and the jilted generation: Using age-period-cohort analysis to assess differential trends in young people's mental health following the Great Recession and austerity in England. *Soc. Sci. Med.* **214**, 133–143 (2018).
123. S. Collishaw, B. Maughan, R. Goodman, A. Pickles, Time trends in adolescent mental health. *J. Child Psychol. Psychiatry* **45**, 1350–1362 (2004).
124. A. Ross, Y. Kelly, A. Sacker, Time trends in mental well-being: The polarisation of young people's psychological distress. *Soc. Psychiatry Psychiatr. Epidemiol.* **52**, 1147–1158 (2017).
125. B. Högberg, M. Strandh, C. Hagquist, Gender and secular trends in adolescent mental health over 24 years—The role of school-related stress. *Soc. Sci. Med.* **250**, 112890 (2020).
126. L. Macchia, Pain trends and pain growth disparities, 2009-2021. *Econ. Hum. Biol.* **47**, 101200 (2022).
127. M. Zuckerman, C. Li, E. F. Diener, Societal conditions and the gender difference in well-being: Testing a three-stage model. *Pers. Soc. Psychol. Bull.* **43**, 329–336 (2017).
128. M. Backhans, M. Lundberg, A. Månsdotter, Does increased gender equality lead to a convergence of health outcomes for men and women? a study of Swedish municipalities. *Soc. Sci. Med.* **64**, 1892–1903 (2007).
129. R. Lalive, A. Stutzer, Approval of equal rights and gender differences in well-being. *J. Popul. Econ.* **23**, 933–962 (2010).
130. E. Trzcinski, E. Holst, Gender differences in subjective well-being in and out of management positions. *Soc. Indic. Res.* **107**, 449–463 (2012).
131. D. Cotter, J. M. Hermsen, R. Vanneman, The end of the gender revolution? Gender role attitudes from 1977 to 2008. *Am. J. Sociol.* **117**, 259–289 (2011).

Acknowledgments: J.-E.D.N. thanks Gallup for making the Gallup World Poll available as part of a research advisor agreement. **Funding:** This work was supported by the British Academy grant PFOS21\210026 (N.M.). **Author contributions:** Conceptualization: C.K., N.M., E.-Q.T., and J.-E.D.N. Data curation: C.K. and N.M. Formal analysis: C.K. and N.M. Funding acquisition: N.M. and J.-E.D.N. Investigation: C.K. and N.M. Methodology: C.K., N.M., and E.-Q.T. Project administration: C.K., N.M., and J.-E.D.N. Software: C.K. and N.M. Resources: C.K., N.M., and J.-E.D.N. Supervision: C.K., N.M., and J.-E.D.N. Validation: C.K. and N.M. Visualization: C.K. and N.M. Writing—original draft: C.K., N.M., and E.-Q.T. Writing—review and editing: C.K., N.M., E.-Q.T., and J.-E.D.N. **Competing interests:** The authors declare that they have no competing interests. **Data and materials availability:** All data needed to evaluate the conclusions in the paper are present in the paper and/or the Supplementary Materials. Data from the GSS can be accessed at gss.norc.org, and Eurobarometer data are available at www.gesis.org. Gallup World Poll data are subject to licensing restrictions, making them unavailable for public access. J.-E.D.N. was given access to the data as part of a research advisor agreement. C.K. and N.M. were given access via a data purchase agreement between Warwick Business School and Gallup. The data used in this study are available upon reasonable request. Requests can be directed to Gallup directly via this link: https://gallup.com/analytics/318923/world-poll-public-datasets.aspx. Access to the data is contingent on obtaining the necessary approvals from Gallup, which may involve a data sharing agreement. The code necessary to reproduce all analyses is available at https://github.com/nmuggleton/two_paradoxes_womens_wellbeing. A static version of the code can be found at https://doi.org/10.5061/dryad.ns1rn8q34.

Submitted 15 September 2024
Accepted 24 January 2025
Published 5 March 2025
10.1126/sciadv.adt1646