

A Well-Being Snapshot in a Changing World

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Over the last few decades, globalized, technology-driven growth has enabled U.S. consumers to experience new, improved, and cheaper goods and services. These range from better medical procedures, healthier foods, and safer transportation, to ubiquitous digital communication and on-demand entertainment. The emergence of the “gig economy” (i.e., on-demand, online labor markets) has given workers increased autonomy, flexibility, and independence. More broadly, the societal and cultural change that accompanies globalization, technological progress, and economic growth, is often characterized by increased liberties, openness, social development, and empowerment.

However, the same forces of globalization and technological progress that have brought these improvements can also have negative impacts on well-being. Price-reducing geographical flexibility in production may increase worker anxiety. Efficiency-increasing artificial-intelligence systems may threaten workers’ jobs. The gig economy may result in workers giving up many of the benefits of a full-time job. The societal changes that empower some may leave others feeling disoriented, disconnected, and powerless.

The fruits and costs of these economic and social transformations may be borne dis-

proportionately by different groups. When studying the distributional consequences of growth, economists traditionally focus on market goods—or the income that enables their consumption—in part because these data are most readily available. Following Easterlin (1974), a growing number of economists have also studied self-reported well-being, typically focusing on responses to a single survey question, or a small number of questions—again, in large part because of data availability.

In this paper, we analyze data from a survey in which we asked respondents to self-report how they rate on one or more of 204 aspects of well-being. The 204 aspects are those that we expected to be most closely related to globalization and technology-driven growth among a much larger set of over 2,000 aspects of well-being included in our survey. The larger set is intended to be a reasonably comprehensive list of “fundamental” goods—goods that are the ultimate objects of desire (c.f., Lancaster, 1966). Consumption of market goods, time, and other intermediate aspects of well-being are viewed as inputs into these final goods (for a formal framework, see Benjamin et al., 2014).

We ask how different groups in the U.S. population differ in their self-reported levels of these 204 aspects.

I. Survey Overview

We ran our survey on Amazon’s Mechanical Turk (MTurk) platform in five waves between December, 2016 and August, 2017. Our sample is demographically diverse but not nationally representative (see online appendix table A1).

While our survey includes measures of additional aspects of well-being and other types of questions, in this paper we focus on self-reported ratings of the 204 aspects discussed below. Each rating question asks: “Thinking about the past year, how would

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you rate [Aspect of well-being]?” Respondents move a horizontal slider, where response options are integers from 0 to 100. We experimentally varied the labels on some response options, and we pool the data across these variations; see online appendix for screenshots and further details, and see Benjamin et al. (2017) for a discussion of how we developed the full list of 2,000+ aspects of well-being.

We analyze data from 1,576 respondents who self-rated at least one of the 204 aspects.¹ Respondents were paid by the number of questions they answered, and chose when to stop. The median respondent rated 6 of the 204 aspects (mean = 23, SD = 42).

We aggregated the 204 aspects into seven themes (see table 1 for a complete list):

- **Satisfaction:** 33 broad, evaluative aspects, e.g., “how satisfied you are with your life,” “your overall well-being,” and “you achieving the things in your life that are worth wanting to achieve.”
- **Affect:** 31 positive and absence-of-negative aspects, e.g., “how happy you feel,” “how often you feel good,” and “you not feeling anxious.”
- **Growth:** 21 items related to perceptions about economic, technological, and knowledge-based growth, e.g., “how quickly science is advancing,” “the total size of your nation’s economy (GDP),” and “how fast technology and productivity are improving.”
- **Autonomy:** 31 aspects related to the autonomy, control, and flexibility offered by the gig economy, e.g., “you being your own boss,” “you having autonomy in your job,” and “you having control over your own time at work.”
- **Job:** 32 aspects of workplace well-being that apply also, or even mainly, to the traditional economy, e.g., “the overall quality of your experience at work,” “you and your coworkers working together as an effective team,” and “you feeling that your work has value.”

¹In survey waves 2–5, aspects were sampled at random from our full 2,000+ list. In wave 1, a fixed set of 27 aspects was rated by all respondents. Five of the 27 are among the 204 aspects we study here and are therefore oversampled relative to the other 199 aspects.

- **Calmness:** 28 aspects, e.g., “the amount of stability in your life,” “you not feeling under constant strain,” and “you not feeling restless.”
- **Belonging:** 28 aspects, e.g., “your sense of community,” “you fitting in,” and “you feeling you belong.”

We constructed each theme’s list based on the concepts captured by the aspects’ wording; we did not check how varying the lists would affect the findings below.

The first two themes, Satisfaction and Affect, correspond to the two types of self-reported well-being measures that are most widely used: “evaluative” measures of overall well-being (e.g., a question about life satisfaction) and “affective” measures of general emotional states (e.g., happiness and anxiety). These two themes allow us to compare the demographic differences in our sample with those reported in the literature, including in more nationally representative samples.

The third theme, Growth, includes *perceptions* of things that can be objectively quantified, such as economic growth, scientific advance, and technological progress. We included them as aspects of well-being because they may be public goods that are valued in themselves. To the extent that perceptions about their objective quantities are widely shared, we do not expect substantial demographic differences in their ratings.

The last four themes capture aspects of well-being that are especially likely to be impacted by economic growth, technological change, and labor-market disruptions: Autonomy and Job correspond to aspects directly related to workers’ well-being, while Calmness and Belonging capture specific positive feelings that may be disrupted by rapid change.

For respondent distributions of mean aspect ratings by theme across demographic groups, see online appendix table A2.

II. Analysis and Findings

We analyze our data with seven regressions. Each dependent variable is one theme’s aspect ratings, demeaned at the aspect level. The independent variables are:

TABLE 1—204 ASPECTS BY THEME

Satisfaction: everything being where it should be in your life; everything that matters to you and your family; everything you take into account when you make decisions; how close your life is to being ideal; how desirable your life is; how much you like your life; how satisfied you are with your life; the extent to which you have a “good life”; the overall well-being of you and your family; the overall well-being of your family; things being the way they should be in the life of you and your family; things being the way they should be in your life; things working out the way they should in your life; you achieving the things in your life that are worth wanting to achieve; you achieving your goals; you and your family living a wonderful life; you being content with your life; you being satisfied and content; you feeling contentment; you getting the things you want out of life; you having a good life; you having the things in your life that are worth going after; you having the things in your life that you want for their own sake, not just to look good to other people; you having the things you would advise a younger version of yourself to strive for and go for; you having the things you would want if you could live the last year over again; you having the things you would want to have if you were the best version of yourself; you living a life that you and your family are proud of; you living a wonderful life; you living the life that you have always dreamed of; your family living a wonderful life; your life going well; your overall well-being; your rating of your life on a ladder where the lowest rung is “worst possible life for you” and the highest rung is “best possible life for you”

Affect: how happy you feel; how much of the time you feel happy; how much you enjoy your life; how not unhappy you feel; how often you feel good; how often you feel good emotionally; how often you feel good mentally; the absence of anger in your life; the absence of fear in your life; the absence of frustration in your life; the absence of sadness in your life; the absence of stress in your life; the absence of worry in your life; you enjoying every day; you enjoying the things you do every day; you feeling a warm feeling in your heart; you feeling cheerful; you feeling compassion; you feeling compassionate; you feeling joy; you feeling love; you feeling rapture; you feeling reasonably happy, all things considered; you not being unhappy; you not feeling anxious; you not feeling depressed; you not feeling frustrated; you not feeling too much anger; you not feeling too much envy or jealousy; you not feeling too much sadness; you not feeling unhappy

Growth: how fast knowledge is growing; how fast technology and productivity are improving; how fast the quality of medical care is increasing; how much better the standard of living will be for the next generation 25 years from now; how much relevant new practical knowledge is discovered each year in the world; how quickly science is advancing; how quickly space exploration is advancing; the amount of wonderful new apps being created each year; the amount of wonderful new books being produced each year; the amount of wonderful new games of all types being created each year; the amount of wonderful new kinds of toys being created each year; the amount of wonderful new movies being produced each year; the amount of wonderful new music being produced each year; the amount of wonderful new online resources being created each year; the amount of wonderful new physical products being introduced each year; the amount of wonderful new scientific discoveries being made each year; the amount of wonderful new services being introduced for the first time each year; the amount of wonderful new TV shows being produced each year; the amount of wonderful new visual art being created each year; the rate of economic growth (GDP growth) over time in your nation; the total size of your nation’s economy (GDP)

Autonomy: how much time you have at work to do other things not directly related to your work; how often you become deeply engaged in your daily activities (so deeply engaged that you lose track of time); how safe your workplace is; how well controlled and comfortable the temperature is at the place you work; how well you are treated by your boss; the place where you work not being physically uncomfortable; the satisfaction you get from doing something you know how to do well; time passing quickly at your job because you are so engaged; you being able to concentrate on what you are doing; you being able to do things the way you want to do them at work; you being able to manage your time well at work; you being at the top of your game; you being in the zone; you being treated as an equal at work; you being treated well by your boss; you being your own boss; you feeling comfortable with the people at work; you feeling on top of your game; you feeling respected at your job; you having autonomy in your job; you having control over your own time at work; you having room to breathe in your schedule at work; you having well-defined work objectives at your job; you not being bossed around by idiots; you not being put into a position where you have to do something you hate doing; you not feeling “under the gun” at your job; you not having personal conflicts with people at work; you not having to do distasteful things at work; your boss not being controlling; your boss not being manipulative; your boss not being verbally abusive

Job: how high your income is compared to the income of other people around you; people appreciating the work you do rather than taking it for granted; people being pleased with your work; people not making your job harder than it has to be; people valuing your contributions at work; people working with you, rather than against you; the overall quality of your experience at work; you and your coworkers working together as an effective team; you being honored for your work; you being loved by people at work; you feeling masterful in dealing with the challenges in your work; you feeling part of a team; you feeling that you are accomplishing something at work; you feeling that your work has value; you getting an honest day’s pay for an honest day’s work; you getting the income you deserve; you getting the job you deserve; you getting the kind of job you deserve; you getting your fair share economically; you having a best friend at work; you having good friends at work; you having learning opportunities at your job; you having someone you can count on at work; you not being trapped in a dead-end job; you not having a lower income than the people around you; your ability to make things happen at work; your ability to motivate other people to act according to your vision; your boss and coworkers being supportive of you; your coworkers being able to do the jobs they are supposed to do; your coworkers being clean, polite and pleasant; your coworkers following through with what they tell you they will do; your enjoyment of concentrating and being focused

Calmness: how calm your life is; how often you can feel relaxed instead of feeling your life is hectic; how peaceful your life is; how peaceful, calm, and harmonious your life is; people honoring tradition; the amount of order and stability in society; the amount of order and stability in your life; the amount of order in society; the amount of order in your life; the amount of stability in society; the amount of stability in your life; things being planned out in your life; things being steady and dependable in your life; you being able to revisit the familiar places of your childhood; you being able to revisit the same places and experiences you experienced in the past; you feeling that your way of life is secure; you feeling your job is secure; you not feeling overwhelmed; you not feeling restless; you not feeling that your life is falling apart; you not feeling under constant strain; you not having to worry about your family members being unemployed; your cultures and traditions being honored; your cultures and traditions being preserved; your life not feeling like a roller coaster; your sense of security about life; your sense of security about life and the future in general; your sense of security about the future in general

Belonging: you being connected to your neighbors; you being part of a community where people care about each other; you being understood by the people you care about; you feeling a sense of belonging to your local community; you feeling a sense of communion with other people; you feeling connected to a long tradition you are proud of; you feeling connected to your family’s roots; you feeling part of the nation and area where you live; you feeling that you are not alone in this world; you feeling you are on the same page as the people around you; you feeling you are part of a “we” instead of only being a separate individual; you feeling you are part of a community; you feeling you belong; you fitting in; you fitting into and feeling at home in your community and the area where you live; you fitting into the social groups you are a part of; you getting strength and solace from traditions; you having a group you belong to; you having a sense of your true place in the world; you not being lonely; you sharing powerful experiences with other people; your ability to connect with your own history and heritage; your ability to get together face to face or online with the people you want to get together with; your sense of belonging; your sense of belonging to a good social “tribe”; your sense of community; your sense of community, belonging, and connection with other people; your sense of connection with other people

continuous variables for age, age², and log income, and indicator variables for all other demographic categories (see below). Standard errors are clustered by respondent.

Table 2 presents our results. To deal with multiple hypothesis testing, we assess “statistical significance,” which we indicate with an asterisk, using a false discovery rate (FDR) threshold of 10%, calculated using the Benjamini and Hochberg (1995) algorithm. Rather than controlling the Type I error rate for any particular coefficient, the FDR threshold ensures that the null hypothesis is true (in expectation) for at most 10% of the coefficients we indicate as significant.

Using the same FDR threshold with two new sets of hypotheses, we also indicate, with a dagger, coefficients that are statistically different from their corresponding Satisfaction coefficient and, with a double dagger, Job coefficients that are statistically different from their corresponding Autonomy coefficients; see online appendix section A3 for stacked-regression specifications. As a broad, widely used measure, Satisfaction is a natural benchmark for comparisons; we compare Autonomy and Job because growth and technology might increase autonomy and flexibility while worsening other aspects of workplace well-being.

A. *Evaluative and Affective Self-Reported Well-Being*

Table 2’s first two columns broadly replicate standard findings on demographic differences in evaluative and affective well-being measures (see, e.g., Clark, 2018). In both columns, we find that measured well-being has a U-shaped relationship with age; is increasing with log income (but statistically less so for Affect, which is not statistically different from zero using the FDR threshold of 10%); is lower among those who have no romantic partner and those who are not employed full time (although, again, some of the negative coefficients do not reach the FDR threshold); and is higher among those for whom religion is at least a little important. This qualitative replication of findings from standard single-question measures in representative samples is reassuring.

B. *Growth-Related Perceptions*

As shown in the third column, the coefficients in the Growth regression are generally small, are never statistically different from zero, and are often statistically significantly smaller than those in the Satisfaction column. Thus, we find no detectable demographic differences in perceptions of growth-related quantities, suggesting these perceptions are broadly shared. We interpret this result as passing a reasonable falsification test: the lack of demographic associations for Growth provides reassurance that artifactual differences across demographic groups (e.g., different ways of using the 0–100 response scale) are not driving the differences that we observe for other themes.

C. *Autonomy-, Job-, Calmness-, and Belonging-Related Aspects of Well-Being*

Our main results are reported in the fourth through seventh columns. We highlight three findings.

First, all coefficients corresponding to the demographics that are significant for Satisfaction—age², income, no romantic partner, and religion—have the same sign as Satisfaction but are almost always smaller, often statistically significantly so, and are often not significantly different from zero. This pattern indicates that these demographics’ relations with Autonomy, Job, Calmness, and Belonging are weaker than with Satisfaction. But the demographic relationships for Satisfaction, which are often similar for Affect (though with a flatter income gradient), are among those that have received the most attention in the subjective well-being literature. We find that when we examine our more specific dimensions of self-reported well-being, some of these relationships are less dominant.

Second, being unmarried (with or without a partner) is substantially less negatively associated with Autonomy, Job, Calmness, and Belonging than it is with Satisfaction, almost always statistically so. The association may even flip sign for the partnered unmarried, though not statistically significantly. We discuss this finding below.

TABLE 2—SELF-REPORTED RATINGS BY DEMOGRAPHIC GROUP AND ASPECT THEME

Aspect theme	Satisfaction	Affect	Growth	Autonomy	Job	Calmness	Belonging
Demeaned age	-1.0	0.1 [†]	0.7	0.0	-0.3	-0.1	0.0 [†]
(in decades)	(0.8)	(0.7)	(0.6)	(0.7)	(0.7)	(0.8)	(0.7)
Demeaned-Age ²	1.5*	1.3*	-0.1 [†]	0.2 [†]	0.6 [†]	0.9* [†]	0.8 [†]
	(0.4)	(0.3)	(0.3)	(0.4)	(0.3)	(0.4)	(0.3)
Male	0.4	-0.2	0.7	1.3	0.7	1.3	0.8
	(1.7)	(1.5)	(1.3)	(1.5)	(1.4)	(1.6)	(1.4)
log (Income in \$)	4.0*	1.9 [†]	0.6 [†]	3.0*	3.5*	3.6*	3.1*
	(1.2)	(1.0)	(0.8)	(1.0)	(1.0)	(1.1)	(1.0)
At least 1 child	0.7	-0.7	-0.2	0.3	2.1	-0.3	0.4
	(1.9)	(1.6)	(1.5)	(1.7)	(1.6)	(1.7)	(1.6)
Unmarried, has partner	-2.6	-1.5	1.1	0.4	1.4 [†]	0.8 [†]	0.5 [†]
	(2.3)	(2.1)	(1.6)	(2.2)	(2.1)	(2.2)	(2.2)
Unmarried, no partner	-6.3*	-5.3*	-2.5	-0.9 [†]	-2.1 [†]	-1.9 [†]	-2.7 [†]
	(2.1)	(1.7)	(1.5)	(1.7)	(1.6)	(1.8)	(1.7)
High school or less	-0.7	-0.6	3.9	0.9	-0.2	-1.3	2.6
	(2.9)	(2.6)	(1.8)	(2.5)	(2.6)	(2.9)	(2.8)
Some college	0.4	-0.5	-0.9	-0.2	0.9	0.5	0.8
	(1.6)	(1.4)	(1.4)	(1.5)	(1.4)	(1.5)	(1.4)
Graduate degree	-0.7	-1.4	0.1	-0.5	0.3	0.2	-1.0
	(3.0)	(2.6)	(1.9)	(2.4)	(2.4)	(2.7)	(2.6)
Black	1.3	1.3	2.3	0.7	4.3	2.1	1.5
	(2.4)	(2.0)	(1.8)	(2.3)	(2.2)	(2.4)	(2.1)
Hispanic	2.3	2.1	1.8	-0.2	2.6	1.6	1.1
	(3.6)	(3.3)	(1.9)	(2.9)	(3.3)	(3.0)	(3.4)
Asian	-3.1	-1.4	-0.3	-4.1	-3.1	-3.0	-3.1
	(2.8)	(2.3)	(2.0)	(2.5)	(2.1)	(2.8)	(2.5)
Unemployed	-6.1	-5.1	2.5 [†]	-3.5	-7.8*	-2.5 [†]	-4.4
	(3.3)	(2.6)	(1.9)	(2.7)	(2.5)	(2.8)	(2.7)
Other employment status	-4.2	-5.0*	-0.1	-1.0 [†]	-5.0* [‡]	-2.4	-4.2*
	(1.8)	(1.5)	(1.3)	(1.5)	(1.5)	(1.6)	(1.6)
Religion important	6.8*	6.6*	-0.4 [†]	2.2 [†]	4.4* [†]	4.0* [†]	6.9*
	(1.6)	(1.4)	(1.3)	(1.4)	(1.4)	(1.5)	(1.3)
Republican	0.8	-0.7	-0.2	0.4	0.0	0.6	-0.9
	(1.9)	(1.7)	(1.4)	(1.6)	(1.6)	(1.7)	(1.6)
Independent	2.7	0.6	-1.6	4.6	1.3	2.0	-1.0 [†]
	(2.0)	(1.6)	(1.7)	(1.9)	(1.6)	(2.1)	(1.8)
Mid-West	-1.1	0.2	-2.1	-0.7	-3.1	-1.6	-0.2
	(1.8)	(1.7)	(1.6)	(1.8)	(1.7)	(2.0)	(1.7)
North-East	0.8	-1.2	-0.8	0.0	1.1	-1.8	0.1
	(2.0)	(1.8)	(1.4)	(1.6)	(1.6)	(1.8)	(1.7)
West	0.4	-0.9	-2.8	-0.5	-0.8	-1.9	0.1
	(2.5)	(2.1)	(1.7)	(2.1)	(2.0)	(2.2)	(2.2)

Note: *Significant using a false discovery rate of 10%. [†]Significantly different from corresponding Satisfaction coefficient using a false discovery rate of 10%. [‡]Job coefficient significantly different from corresponding Autonomy coefficient using a false discovery rate of 10%. Number of observations, by column: 5802 (1199 individuals), 6151 (1178 individuals), 3207 (731 individuals), 4936 (845 individuals), 5794 (1204 individuals), 4484 (838 individuals), 5096 (1162 individuals). SEs clustered by individual. Separate “Missing” categories (not shown) are used for each categorical variable. Omitted categories: Female, No children, Married, Bachelor’s degree, White, Employed full-time, Religion not important, Democrat, and South.

Third, while all themes but Growth are negatively associated with not being employed full-time, the most (and almost only) statistically significant associations are for

Job. Almost all other coefficients are substantially smaller (in absolute value). In particular, consider those neither full-time employed nor unemployed, in the “Other empl.

status” row. They include part-time employees, disabled, homemakers, and students—those who may benefit most from the emergence of the gig economy. Indeed, the large negative coefficient on Job contrasts with a coefficient on Autonomy that is not statistically different from zero, and is statistically smaller than the coefficients on both Job and Satisfaction.

III. Discussion

We would like to answer the question of how recent economic growth has causally affected various aspects of well-being. We cannot answer it because we have cross-sectional data, rather than a panel, with no source of exogenous variation in growth. Nonetheless, the analysis we conduct—examining demographic differences in aspects of well-being in a convenience sample at a single point in time—might be useful for singling out aspects, or aspect themes, that should begin to be measured in panel data. Indeed, our findings of somewhat different demographic associations for Autonomy, Job, Calmness, and Belonging relative to the standard self-reported well-being measures suggest that these aspects might also be affected differently by experimental or policy interventions.

Our findings that different aspects (or themes) are distributed somewhat differently in the population raises a natural question: Which dimensions of well-being are important to people? In Benjamin et al. (2014), we make some initial progress on this question by asking people to make tradeoffs between different aspects of well-being, and using them to estimate the aspects’ marginal rates of substitution. We asked such tradeoff questions also in the present survey. As we collect more data, we hope to be able to address the question of how people value the aspects relative to each other.

Another natural question is *why* different groups have different levels of the aspects. Viewed through the lens of a model of home production, this question becomes: Do groups with lower levels of a particular aspect of well-being produce less of it due to preferences or due to constraints? The an-

swer may have policy implications. Consider people with no romantic partner, who rate themselves much lower than others on Satisfaction but significantly less so on Autonomy and Job. If their relatively better ratings on work-related well-being reflect that they care a lot about it (and therefore invest in it), then they might be hit harder than others by job loss or insecurity. In contrast, if their ratings reflect a relative advantage in producing work-related well-being rather than general evaluative well-being, then a decrease in job quality may decrease their well-being by less. Investigating whether different levels of aspects are driven by such “demand” or “supply” factors is left for future research.

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ONLINE APPENDIX

A1. Scale Frames

Here we outline our methodology for pooling data across our different scale-label schemes. We will refer to each scheme as a *scale frame*. Below is an example of a scale frame. Note the labels at 0 and 100 that say “the lowest you can imagine” and “the highest you can imagine”, and at 25 and 75 that say “extremely low” and “extremely high.”

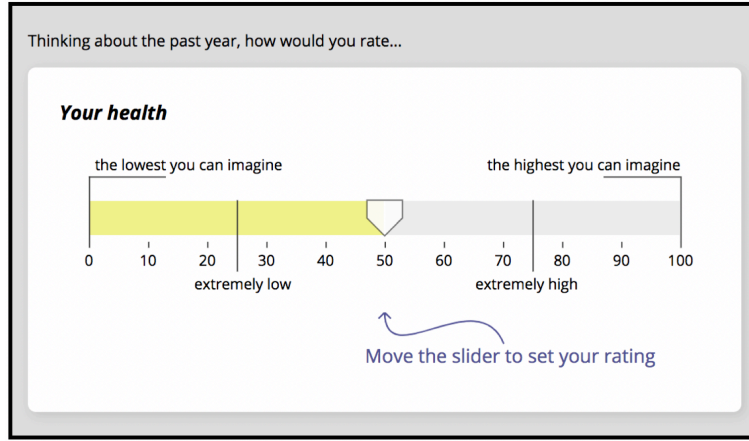


FIGURE A1. “EXTREME” SCALE FRAME

Our dataset contains ratings from four scale frames. In addition to the “extreme” frame shown above, we collect data for: (1) an “extraordinary” scale frame with labels at 0 and 100 that say “lowest you can imagine” and “highest you can imagine”, and at 25 and 75 that say “extraordinarily low” and “extraordinarily high”; (2) a “base year” scale frame with labels at 10 and 90 that say “lowest of anyone, anywhere on Earth” and “highest of anyone, anywhere on Earth”; and (3) an “endpoint-only” scale frame with labels at 0 and 100 that say “lowest you can imagine” and “highest you can imagine.” To pool these ratings, we use the following methodology:

Let r_{ijf} be individual i 's rating of aspect j using the scale frame f . For each aspect-frame pair, we calculate average ratings across individuals, μ_{jf} . We then choose one frame as a “reference” scale frame (f_{ref}). For the results in this paper, we use the “extreme” frame as the reference frame. Ratings for this scale frame are unaltered. To transform ratings for each alternate scale frame, f , we regress aspect averages for f_{ref} on aspect averages for f using the specification:

$$(A1) \quad \mu_{jf_{\text{ref}}} = \beta_{0f} + \beta_{1f}\mu_{jf} + \epsilon_{jf}.$$

Note that this specification allows responses to be shifted and stretched across scale frames; it assumes that responses in a given scale frame are, on average, a linear transformation of responses in another scale frame.

For each scale frame, we use the estimated coefficients to predict individual ratings as if they were in the reference scale frame. Specifically,

$$(A2) \quad \hat{r}_{ijf_{\text{ref}}} = \hat{\beta}_{0f} + \hat{\beta}_{1f}r_{ijf}.$$

We use (A2) to transform all individual ratings on frames other than the reference frame. We pool all values of $\hat{r}_{ijf_{\text{ref}}}$ and $r_{ijf_{\text{ref}}}$ to conduct our analysis.

A2. Regression specification

Here we outline our methodology for estimating differences in levels across demographic groups for different aspect themes, $\mathbf{s} = \{s_1, s_2, \dots\}$.

Let r_{ij} be individual i 's rating of aspect j . To avoid estimating possible interactions between aspect means and demographics, we demean all ratings at the aspect level. For a given theme, s , we limit our sample to observations for which $j \in s$. The model is specified as follows:

$$(A3) \quad r_{ij} - \mu_j = \beta_0 + \beta_{\mathbf{X}} \mathbf{X}_i + \epsilon_{ij},$$

for which

- μ_j is the rating average for aspect j across individuals
- \mathbf{X}_i is a vector of demographic variables.

For the results reported here, \mathbf{X}_i includes continuous variables for

- Age (demeaned, 1 unit = 10 years)
- Age² (demeaned, then squared, 1 unit = (10 years)²)
- log(Income in \$)

and indicator variables for

- Male (omitted category: female)
- Having at least one child (omitted category: having no children)
- Unmarried, has romantic partner (omitted category: married)
- Unmarried, no romantic partner (omitted category: married)
- Completed high school or less (omitted category: bachelor's degree)
- Completed some years of college (omitted category: bachelor's degree)
- Completed a graduate degree (omitted category: bachelor's degree)
- Race = black (omitted category: white)
- Race = hispanic (omitted category: white)
- Race = asian (omitted category: white)
- Unemployed (omitted category: full-time employment)
- Reported "part time employee", "disabled", "homemaker", "student", "other", "declined" as employment status (omitted category: full-time employment)
- Reponse of "a little important", "pretty important", and "very important" to the question "How important is religion in your life?" (omitted category: responded "not important")
- Republican (omitted category: Democrat)
- Independent or reported "other" as political party affiliation (omitted category: Democrat)
- State of residence in the Mid-West (omitted category: South)
- State of residence in the North-East (omitted category: South)
- State of residence in the West (omitted category: South).

\mathbf{X}_i also includes indicator variables for missing respondent data for each categorical variable (gender, marital status, education, race, religious importance, employment status, political affiliation, state of residence, and number of children). While these missing-data variables are included in the regression, we do not report their estimated coefficients as we are unable to interpret them. The number of respondents with missing data for each demographic variable is reported in online appendix table A1.

We use OLS regression to get estimates for the model specified in (A3). Standard errors are clustered by individual. We run the model seven times, once for each aspect theme. The estimates of interest, $\hat{\beta}_{\mathbf{X}}$, are shown in the columns of table 1. To assess significance, we use a false discovery rate (FDR) threshold of 10% for the 147 estimates shown in table 1, calculated using the Benjamini and Hochberg (1995) algorithm (details in online appendix section A4).

A3. Interaction model specification

Here we outline our methodology for estimating differences in $\hat{\beta}_{\mathbf{X}}$ across aspect themes. First, we denote one theme, s_{ref} , as the reference theme. Estimates for all other themes will be compared against estimates for this reference theme. For the results reported in online appendix table A3 (and to denote coefficients with a † in table A1), we chose Satisfaction as the reference theme. The other six themes are Affect, Growth, Autonomy, Job, Calmness, and Belonging.

Let r_{ij} be individual i 's rating of aspect j . To avoid estimating possible interactions between aspect means and demographics, we demean all ratings at the aspect level. The model is specified as follows:

$$(A4) \quad r_{ij} - \mu_j = \beta_0 + \beta_{\mathbf{I}} \mathbf{I}_{s_j} + \beta_{\mathbf{X}} \mathbf{X}_i + \beta_{\mathbf{IX}} (\mathbf{I}_{s_j} \times \mathbf{X}_i) + \epsilon_{ij},$$

for which

- \mathbf{I}_{s_j} is a vector of indicator variables for if aspect j is in each theme in $\mathbf{s} = \{s_1, s_2, \dots\}$, other than s_{ref} .

Other variables in (A4) are identical to those defined for (A3).

We use OLS regression to get estimates for the model specified in (A4). Standard errors are clustered by individual. Note that $\hat{\beta}_{\mathbf{X}}$ can be interpreted as the relationship between ratings on a 0–100 scale for aspects in the reference theme (Satisfaction) and the demographic variables in \mathbf{X}_i . These estimates are listed in online appendix table A3 under the first column, “Satisfaction.” $\hat{\beta}_{\mathbf{IX}}$ can be interpreted as how these relationships change for the other six themes. These estimates are reported in the six right-most columns of online appendix table A3. To assess significance, we use a false discovery rate (FDR) threshold of 10%, calculated using the Benjamini and Hochberg (1995) algorithm (details in online appendix section A4).

We use the same model to estimate differences in $\hat{\beta}_{\mathbf{X}}$ for the Autonomy and Job themes. Specifically, the model is run with $\mathbf{s} = \{s_{\text{autonomy}}, s_{\text{job}}\}$ and $s_{\text{ref}} = s_{\text{autonomy}}$. Significant differences are denoted with a ‡ in table 1.

A4. Detailed methodology: false discovery rate control

Let N be the total number of hypotheses we test, R be the total number of hypotheses we declare as significant, and a be the number of hypotheses declared significant, but are actually null. Our approach to handling false positives is to bound the expected proportion of false positives, a/N , i.e., the false discovery rate (FDR). We first specify a false discovery rate threshold, q , that bounds our expected FDR. To test for significance, we employ Benjamini and Hochberg’s (1995) algorithm. It is as follows:

- 1) Compute a p-value for each hypothesis $i = 1, 2, \dots, N$.
- 2) Reindex the p-values from least to greatest: $p_1 \leq p_2 \leq p_3 \leq \dots \leq p_N$.

- 3) Find the largest index, i_{\max} such that $p_i \leq \frac{i}{N}q$.
- 4) Declare all hypotheses $i \leq i_{\max}$ as significant.

TABLE A1—SAMPLE DEMOGRAPHICS

		Frequency	Percent
Age (0 missing)	Under 18	0	0.0
	18-29	488	31.0
	30-39	543	34.5
	40-49	270	17.1
	50-59	162	10.3
	60-69	96	6.1
	70+	17	1.1
Gender (6 missing)	Female	919	58.3
	Male	651	41.3
Income (0 missing)	Less than \$20,000	191	12.1
	\$20,000 - \$39,999	405	25.7
	\$40,000 - \$59,999	353	22.4
	\$60,000 - \$79,999	266	16.9
	\$80,000 - \$99,999	159	10.1
	\$100,000 or more	202	12.8
Children (1 missing)	No children	810	51.4
	At least 1 child	765	48.5
Marital status (33 missing)	Married	688	43.7
	Unmarried, has partner	379	24.0
	Unmarried, no partner	476	30.2
Education (2 missing)	High school or less	158	10.0
	Some college	573	36.4
	Bachelor's degree	594	37.7
	Graduate degree	249	15.8
Race (49 missing/multiracial)	White	1227	77.9
	Black	121	7.7
	Hispanic	84	5.3
	Asian	95	6.0
Employment Status (0 missing)	Employed full-time	892	56.6
	Other employment status	577	36.6
	Unemployed	107	6.8
Religious Importance (17 missing)	Religion is important	912	57.9
	Religion is not important	647	41.1
Political Affiliation (41 missing)	Democrat	853	54.1
	Republican	466	29.6
	Independent	216	13.7
Region (missing 78)	South	556	35.3
	Mid-West	323	20.5
	North-East	266	16.9
	West	353	22.4

Note: Number of individuals: 1576. Race: “multiracial” coded as missing (42 respondents). Religious Importance: “a little important”, “pretty important”, and “very important” coded as “Religion is important.” Employment Status: “disabled”, “homemaker”, “student”, “other”, “declined” coded as “other employment status.” Political Affiliation: “other” coded as “independent” (30 respondents).

TABLE A2—MEAN RATINGS BY DEMOGRAPHIC GROUP AND ASPECT THEME

	Satisfaction	Affect	Growth	Autonomy	Job	Calmness	Belonging
Age							
18-29	58.8	56.1	60.6	61.6	57.6	57.0	56.0
30-39	60.5	58.1	61.5	62.4	58.1	59.2	56.7
40-49	59.6	58.1	60.7	63.2	59.8	57.6	57.5
50-59	61.5	61.3	60.1	61.4	59.6	59.1	60.1
60-69	64.8	64.6	63.0	65.2	59.7	61.9	61.2
70+	67.6	68.2	59.3	55.3	53.5	66.3	58.6
Gender							
Female	60.1	58.4	60.8	61.8	57.9	57.8	56.8
Male	61.2	59.1	61.4	63.5	59.6	59.9	58.3
Income							
Less than \$20,000	56.7	57.3	59.2	60.1	55.3	57.1	54.0
\$20,000 - \$39,999	55.8	55.2	62.2	59.7	54.7	54.8	54.4
\$40,000 - \$59,999	57.4	56.3	60.8	59.8	56.2	55.8	54.6
\$60,000 - \$79,999	63.7	59.8	61.0	64.5	60.7	61.5	60.5
\$80,000 - \$99,999	66.9	64.3	58.9	65.7	62.7	62.0	61.5
\$100,000 or more	68.3	63.8	62.3	68.3	66.5	65.1	63.1
Children							
No children	57.6	56.4	60.8	61.4	56.3	57.5	55.4
At least 1 child	63.2	60.7	61.3	63.3	60.8	59.7	59.4
Marital status							
Married	64.5	61.5	61.5	63.8	60.9	60.0	59.6
Unmarried, has partner	60.1	58.5	61.9	62.5	59.8	59.3	58.5
Unmarried, no partner	55.1	54.5	59.4	60.6	54.6	56.2	54.0
Education							
High school or less	59.5	58.1	64.7	63.7	57.4	57.3	59.2
Some college	59.7	57.8	60.0	61.4	57.9	58.4	56.8
Bachelor's degree	60.3	58.7	61.0	62.8	58.5	58.3	56.9
Graduate degree	62.3	59.6	61.0	62.6	60.6	60.3	58.3
Race							
White	60.5	58.7	60.9	62.7	58.4	58.8	57.7
Black	61.5	59.8	62.7	63.2	63.0	60.4	60.0
Hispanic	60.2	58.8	63.1	62.1	59.7	58.9	57.1
Asian	58.1	56.7	59.4	58.7	55.4	55.7	54.8
Employment Status							
Employed full-time	63.0	60.9	61.2	63.9	61.7	60.1	59.8
Other employment status	58.3	56.2	60.6	61.4	55.3	57.3	54.7
Unemployed	49.4	50.8	62.2	55.2	48.5	52.3	50.2
Religious Importance							
Religion is important	63.6	61.5	60.9	63.5	60.7	60.4	60.5
Religion is not important	56.0	54.4	61.3	60.8	55.5	56.1	53.0
Political Affiliation							
Democrat	58.7	57.7	60.9	61.1	57.6	57.5	56.8
Republican	63.7	61.0	60.5	63.6	60.6	60.3	59.6
Independent	60.5	56.8	61.2	64.9	58.3	58.6	54.6
Region							
South	61.0	59.3	62.1	63.2	59.9	59.9	58.0
Mid-West	60.0	59.0	60.7	63.1	57.2	58.8	57.9
North-East	60.9	57.9	60.8	62.6	60.6	58.0	57.9
West	60.2	57.7	59.6	62.2	57.3	57.3	56.8

TABLE A3—SELF-REPORTED RATINGS BY DEMOGRAPHIC GROUP AND ASPECT THEME

Aspect theme	Satisfaction	Affect	Growth	Autonomy	Job	Calmness	Belonging
	Baseline	Interactions					
Demeaned Age (in decades)	-1.0 (0.8)	1.1* (0.4)	1.7 (0.8)	1.0 (0.6)	0.7 (0.5)	0.9 (0.4)	1.0* (0.4)
Demeaned-Age ²	1.5* (0.4)	-0.2 (0.2)	-1.6* (0.4)	-1.3* (0.3)	-0.9* (0.3)	-0.6* (0.2)	-0.7* (0.2)
Male	0.4 (1.7)	-0.6 (0.8)	0.3 (1.7)	0.9 (1.2)	0.2 (1.0)	0.9 (0.9)	0.4 (0.9)
Log (Income in \$)	4.0* (1.2)	-2.1* (0.6)	-3.4* (1.2)	-1.0 (0.8)	-0.5 (0.7)	-0.4 (0.7)	-0.9 (0.7)
At least 1 child	0.7 (1.9)	-1.4 (0.9)	-0.9 (1.9)	-0.4 (1.4)	1.3 (1.1)	-1.0 (1.1)	-0.3 (1.1)
Unmarried, has partner	-2.6 (2.3)	1.1 (0.9)	3.7 (2.2)	3.0 (1.4)	4.0* (1.2)	3.4* (1.1)	3.1* (1.1)
Unmarried, no partner	-6.2* (2.1)	0.9 (1.0)	3.8 (2.3)	5.4* (1.6)	4.2* (1.3)	4.3* (1.3)	3.6* (1.2)
High school or less	-0.7 (2.9)	0.1 (1.1)	4.6 (2.7)	1.6 (1.7)	0.5 (1.6)	-0.6 (1.5)	3.3 (1.5)
Some college	0.4 (1.6)	-1.0 (0.9)	-1.3 (2.0)	-0.6 (1.4)	0.5 (1.1)	0.1 (1.1)	0.4 (1.0)
Graduate Degree	-0.7 (3.0)	-0.7 (1.1)	0.8 (2.7)	0.2 (1.6)	1.0 (1.3)	0.9 (1.1)	-0.3 (1.2)
Black	1.3 (2.4)	0.0 (2.0)	1.0 (2.4)	-0.6 (2.0)	3.0 (1.8)	0.8 (1.5)	0.2 (1.5)
Hispanic	2.3 (3.6)	-0.3 (1.3)	-0.5 (3.8)	-2.5 (1.9)	0.3 (1.5)	-0.7 (2.0)	-1.2 (2.0)
Asian	-3.1 (2.8)	1.7 (1.3)	2.8 (2.4)	-1.0 (1.6)	0.0 (1.8)	0.2 (1.4)	0.0 (1.4)
Unemployed	-6.1 (3.3)	1.0 (2.1)	8.6* (3.0)	2.6 (2.9)	-1.7 (1.9)	3.6* (1.5)	1.7 (2.3)
Other empl. status	-4.2* (1.8)	-0.8 (0.9)	4.0 (1.9)	3.1* (1.3)	-0.9 (1.0)	1.7 (1.1)	0.0 (1.0)
Religion important	6.8* (1.6)	-0.2 (0.7)	-7.2* (1.7)	-4.6* (1.1)	-2.4* (1.0)	-2.7* (0.9)	0.1 (0.9)
Republican	0.8 (1.9)	-1.5 (0.8)	-1.0 (1.8)	-0.3 (1.2)	-0.8 (1.0)	-0.2 (0.9)	-1.7 (1.0)
Independent	2.7 (2.0)	-2.1 (1.3)	-4.3 (2.2)	2.0 (1.8)	-1.3 (1.5)	-0.6 (1.5)	-3.7* (1.5)
Mid-West	-1.1 (1.8)	1.3 (1.0)	-1.0 (2.0)	0.4 (1.6)	-2.0 (1.3)	-0.6 (1.2)	0.9 (1.1)
North-East	0.8 (2.0)	-1.9 (1.0)	-1.6 (1.9)	-0.7 (1.5)	0.3 (1.3)	-2.6 (1.2)	-0.6 (1.3)
West	0.4 (2.5)	-1.3 (1.0)	-3.2 (2.4)	-0.9 (1.5)	-1.2 (1.2)	-2.3 (1.1)	-0.3 (1.2)

Note: The table reports estimated coefficients from a single, stacked regression. The dependent variable is aspect rating, demeaned at the aspect level. The independent variables are the demographic variables from online appendix table 1; six indicators for membership in the aspect themes, with Satisfaction as the omitted theme; and a full set of interactions between the demographic variables and the six theme indicators. The first column reports the estimated coefficients on the demographic variables, which capture differences across demographic groups in mean ratings for aspects in the baseline (i.e., omitted) theme, Satisfaction. The other columns report the coefficients on the demographic-by-theme interactions, which capture the differences across demographic groups between mean ratings for aspects in a given theme relative to mean ratings for aspects in the Satisfaction theme. SEs are clustered by respondent. *Significant using a false discovery rate of 10%. Number of observations: 35,470 (1576 individuals). Separate “Missing” categories (not shown) are used for each categorical variable. Omitted categories: Female, No children, Married, Bachelor’s degree, White, Employed full-time, Religion not important, Democrat, and South.