



The  
Graduate Assembly

---

Graduate Student  
Happiness & Well-Being  
Report | 2014

*The mission of the Graduate Assembly is to improve the lives of University of California, Berkeley graduate students and to foster a vibrant, inclusive graduate student community.*

# Top Predictors of Graduate Student Well-Being

## Top Predictors of Satisfaction With Life

*A common, validated measure of positive function, happiness and well-being.*

**Living Conditions**  
**Career Prospects**  
**Financial Confidence**

## Top Predictors of Depression

*A validated measure of negative function used in psychiatric epidemiology.*

**Sleep**  
**Overall Health**  
**Academic Engagement**

## Overall 10 Top Predictors

*By average standardized beta coefficient in Life Satisfaction & Depression models.*

1. Career Prospects
2. Overall Health
3. Living Conditions
4. Academic Engagement
5. Social Support
6. Financial Confidence
7. Academic Progress & Preparation
8. Sleep
9. Feeling Valued & Included
10. Advisor Relationship

## Verbatim

*Concern with finances, social support, advising and career prospects were the most frequent topics in comments.*

*“The largest source of anxiety for me is my job outlook. It is tremendously uncertain and thus fear-inducing.”*

*“At Cal, we have some of the lowest graduate fellowships, and some of the highest living expenses.”*

*“I live on my own for the first time and it is very lonely. I wish there were more exciting ways to meet other grad students.”*

*“Professors should be required to take courses on mentorship and management.”*

## Demographics, Degrees & Fields

Lesbian, gay and bisexual grad students report lower well-being as do students of “other” race/ethnicity and older students. There is no well-being gap by gender or U.S. citizenship status.

About 47% of PhD students and 37% of Master’s and Professional students score as depressed. Students in the Arts & Humanities fare poorly on several indicators and 64% score as depressed.

## Why Do We Care About Well-Being?

We care because we want to enable graduate students to do their best work and make the most of their time here. Balanced, happy people are more productive, more creative, more collaborative, better at long-term goal pursuit, more likely to find employment, more physically and psychologically resilient, and more.

## Recommendations

1. Follow the roadmap provided by the top predictors
2. Promote well-being strategies recommended by students
3. Remove hassles and barriers to beneficial behaviors
4. Start a dialogue
5. Institutionalize the survey

The survey was conducted March 12-April 22, 2014 by the Graduate Assembly in partnership with Graduate Division. It was administered to a stratified random sample of 2,500 graduate students from across schools and colleges with academic and professional degree goals, with oversampling for underrepresented minority students. We received 790 responses for a 32% response rate. The top predictor models ( $R^2 > .40$ ) were derived from a set of 30 candidate predictors and 10 demographic items. This is the first survey of graduate student well-being since 2004. **Download the full report at <http://ga.berkeley.edu/wellbeingreport>.**

The  
Graduate Assembly  
**Graduate Student  
Happiness & Well-Being**  
Report | 2014

## Table of Contents

I. Introduction	1
Acknowledgments	1
II. Major Findings	2
Top Predictors of Graduate Student Well-Being	2
Other Important Findings	6
Comparison to 2004 Survey	8
III. Recommendations	9
IV. Survey Development, Deployment & Analysis	13
Future Surveys	15
V. Annotated Questionnaire	18
VI. “The Objective Benefits of Subjective Well-Being”	31

## Contacts

Galen Panger, Survey Lead

PhD Candidate, School of Information, [galen@ischool.berkeley.edu](mailto:galen@ischool.berkeley.edu)

Janell Tryon, Director of Graduate Student Wellness, Graduate Assembly

MPH Candidate, Public Health, [gssp@ga.berkeley.edu](mailto:gssp@ga.berkeley.edu)

Andrew Smith, PhD, Assistant Dean for Research & Planning, Graduate Division

[aksmith@berkeley.edu](mailto:aksmith@berkeley.edu)

## I. Introduction

The University community has an interest in improving the happiness and well-being of graduate students for a straightforward reason: to enable graduate students to do their best work. Balanced, happy people are more productive, more creative, more collaborative, better at pursuing long-term goals, more likely to find employment, and more physically and psychologically resilient, among other things. Positive emotion is associated with curiosity, interest and synthetic thinking. In contrast, depression is associated with loss of interest, helplessness, difficulty concentrating and remembering details, and worse. For more on this, see Part VI, “The Objective Benefits of Subjective Well-Being,” from the *World Happiness Report*.

This report is based on a survey of graduate students developed by the Graduate Assembly and administered by Graduate Division during the Spring semester of 2014. We assessed 30 items related to basic human needs, academic progress, departmental climate, and well-being maintenance, as well as 10 demographic items. To explore how these factors relate to well-being, we also measured **satisfaction with life**, a common indicator of happiness and positive functioning, and **depression**, an indicator of mental illness and dysfunction. Analysis of the results suggests important new ways to promote graduate student happiness and well-being.

A key finding from the survey is that promoting awareness of healthy habits or well-being resources is necessary but not sufficient to improve graduate student well-being. For example, survey results confirmed the importance of sleep for alleviating depressive symptoms. Inadequate sleep is the top predictor of depression among graduate students. Yet, while presumably students are aware of the importance of sleep and desire sleep, our data shows they are not adequately carrying out this desire. To improve well-being, the University community must go beyond simply raising awareness and help enable beneficial behaviors.

Happiness is an end as well as a means to an end. Graduate school is a formative experience where the self is reconceived, possibilities for one’s life are imagined, and life-long habits are adopted. This process should not occur in the context of depression, yet our survey suggests that many graduate students are depressed. In renewing its focus on happiness and well-being, the University may not only improve the lives of graduate students here, but will join a growing worldwide effort to elevate happiness in the setting of public policy. Happiness is one way to move beyond a sole focus on GDP growth as the yardstick of human progress, especially in light of our environmental challenges, and the University can be part of leading this effort.

## Acknowledgments

The Graduate Assembly would like to thank Graduate Division, Graduate Council, the Chancellor’s Advisory Committee on Student Mental Health, Lisa Alvarez-Cohen, Susan Bell, Tierra Bills, Stephanie Cardoos, Denia Djokic, Michaela Ferrari, Christine Gerchow, Matt Grigorieff, Sonia Hart, Allison Harvey, Kena Hazelwood-Carter, Amy Honigman, Cathy Kodama, Sebastien Lounis, Temina Madon, Sofia Murga, Yuka Ogino, Lyndsey Ogle, Galen Panger, Jeff Prince, John Ready, Andrea Rex, Andrew Smith, Aaron Smyth, Janell Tryon, Dax Vivid and Steve Weber for their involvement and support in this project.

## II. Major Findings

Our goal was to develop a survey that was comprehensive of the major known causes of well-being, tailored to the graduate student experience at Berkeley, and concise. The survey was administered to a stratified random sample of 2,500 graduate students in the Spring semester of 2014. The response rate of approximately 32% included 790 responses from graduate students distributed across the campus from all schools and colleges with academic and professional degree goals.

### Top Predictors of Graduate Student Well-Being

Overall, our survey data behaves coherently, with 26 of 30 substantive items significantly related to both satisfaction with life and depression and in the expected directions. Our two final models, one for each well-being indicator, include the top predictors of satisfaction with life and depression. The two sets of predictors overlap substantially and so are presented together, ordered from most to least predictive overall<sup>1</sup>. We also include open-ended responses from students who offered to elaborate on the issues they felt were important.

#### 1. Career Prospects

Graduate students' beliefs about their career prospects are overall the top predictor of their well-being, strongly predicting their satisfaction with life and depression. Students who feel upbeat about their career prospects are significantly happier and less depressed than students who don't. Concern with career prospects was a major theme of students' written comments.

*“The largest source of anxiety for me is my post-grad job outlook. It is tremendously uncertain, and thus fear-inducing.”*

*“Improve professionalization for non-traditional careers! I cannot tell you how much better my life is now that I know I have a lucrative non-academic job waiting for me at the end of this journey.”*

*“I don't feel competitive or prepared in any way for academic jobs, and I think that in some sense it is a failure of both my advisor and the graduate system to even admit people like me into PhD programs.”*

#### 2. Overall Health

Self-reported physical health is a major predictor of students' mental health, particularly depressive symptoms. It is also a strong predictor of life satisfaction. About 44% of students reported being sick or ill during the semester.

---

<sup>1</sup> By average standardized beta coefficient. Field of Study is also included in the models but not shown in this section.

### 3. Living Conditions

Interestingly, graduate students' feelings about their living conditions are one of the most important predictors of their well-being, particularly their life satisfaction, but also depression. Feeling safe at home and on campus were not major predictors.

*“My only dissatisfaction with my life right now is with my living situation. I feel that, coming from out of state, I could have had more help finding adequate and comfortable housing in Berkeley. ... I was pretty much on my own and I just took what I could find. I would have loved more guidance from the University.”*

### 4. Academic Engagement

Graduate students who are engaged by their day-to-day work have higher life satisfaction and fewer depressive symptoms than those who are not engaged by their day-to-day work.

*“Despite the fact that my life doesn't seem very balanced, I am generally happy because I enjoy my work a lot. A lot of my stress comes from loneliness.”*

*“I am hopeful for the future because I should be graduating. However, I feel like the work I have now done is pointless, so writing the thesis can be hard.”*

### 5. Social Support

In well-being research generally, social relationships stand out for their importance to happiness and mental health, so it's no surprise it matters greatly to graduate students' well-being, too. Here, we ask students whether they feel they have someone they can share their most private worries and fears with. Those who agreed were more satisfied with their lives and, in particular, had substantially fewer depressive symptoms. Social support, loneliness and a desire for social groups and events were the second-most discussed topic in students' written comments, behind financial concerns.

*“I live on my own for the first time and it is very lonely. I wish there were more exciting ways to meet other grad students.”*

*“I've found it more difficult than expected to make friends.”*

*“I feel very fortunate to be part of a number of very supportive, understanding communities, largely cultivated by great mentoring and team-building professors. I know a lot of grad students do not have such communities, and I can imagine that if any of them feel the daily insecurities that I feel about my work, my trajectories, etc., it would be hard to keep these issues in perspective. Cultivating these kinds of communities and having an ‘open door’ or ‘open ear’ available is critical.”*

*“I think we need more diversity events. It would be great to meet other grad students of color.”*

*“Having a supportive partner has been the single most important thing that has gotten me through the bulk of a PhD. Having supportive labmates ranks up there as well. ... If you can*

*figure out a way to form more cohesive communities for those who don't naturally have them, that would do a lot to improve well-being."*

*"The work-life balance is terrible, and there is a culture of silence around how we feel as graduate students. I feel much better after talking with counselors at the Tang Center, but it is a little ridiculous that I have to go to therapy simply to have someone ask me how my day was or how I'm feeling."*

## **6. Financial Confidence**

Graduate students generally lack confidence in their finances, and report worrying about money lately, though there is substantial variance in their responses. Unsurprisingly, students who lack confidence in their finances are less satisfied with their lives and exhibit more depressive symptoms. Graduate students mentioned financial concerns more than any other topic in their written comments.

*"My husband and I would not be able to get by on this salary without taking loans, were it not for the generous financial support of his parents. Our colleagues are in the same position. Many have taken loans, and many are accepting money from their parents. The situation is even more dismal for graduate students with children."*

*"My quality of life as a graduate student at Berkeley suffers most directly from insufficient financial resources to cover the cost of living in what is an expensive area to live."*

*"At Cal, we have some of the lowest graduate fellowships, and some of the highest living expenses."*

*"I don't go out with friends because I can't afford it, thus all work and no play."*

*"The only reason that I have been able to live comfortably this year is that a friend is letting me house-sit for half the usual rent. Otherwise money in the past has been so tight that I have to double think whether I can eat out with friends or go anywhere. It is frustrating."*

## **7. Academic Progress & Preparation**

Graduate students who are on track to complete their degrees on time and who feel well-prepared for the work required to complete their degrees have higher life satisfaction and fewer depressive symptoms than those who are not on-track and feel ill-prepared.

*"I don't feel the theoretical stats courses I took helped me with my actual analysis. We are just expected to figure it out on our own. This can be frustrating and cause a lack of confidence for the final and most difficult push, the write-up."*

## **8. Sleep**

Sleep is a known correlate of depression, and research by experts like UC Berkeley Professor Allison Harvey suggests that simply improving sleep can substantially reduce depressive symptoms. Graduate students report that they do not get enough sleep at night to feel fully

rested and alert during the day, and on average they slept only 6.6 hours a night during the past week. Only 20% reported sleeping the recommended eight hours during the past week on average. For graduate students, sleep is the strongest predictor of depression, but it is not a top predictor of life satisfaction.

*“I realized that I need to sleep. So I’m going to sleep.”*

## **9. Feeling Valued & Included in the Department**

Students who feel valued and included by peers, faculty and administration in their departments have higher life satisfaction. It is not a top predictor of depression. Inclusion was a noticeable theme of students’ written comments.

*“I have had a wonderful experience at Berkeley. I feel supported by the students in my PhD program and the faculty in my department.”*

*“The faculty at the law school needs to be more culturally conscious.”*

*“Fellow graduate students routinely make comments that are deeply discriminatory. The department offers no forum, no seminar to address these problems and prepare graduate students to be aware of the issues faced by marginalized communities.”*

*“Racial microaggressions are the hardest part of graduate school.”*

*“Berkeley is one of the best places I’ve ever seen as far as inclusion and support of trans and genderqueer individuals, and I would like to see the campus continuing to support those efforts—as a transgendered individual it’s still very difficult to maintain just a normal standard of life on top of being a grad student.”*

## **10. Mentorship & Advising**

Having an advisor who is “a real mentor to me” is an important predictor of graduate students’ life satisfaction but not depression. Advisors have influence over many other predictors here, including academic progress and preparation, finances, career prospects and feeling valued and included in the department, so their importance as mentors is not surprising. Mentorship and advising were a major theme of students’ written comments.

*“My adviser is not useful as a mentor and doesn’t really help much with my project, but that is typical for advisers and if you expect otherwise, you didn’t have realistic expectations for graduate school.”*

*“My advisor doesn’t respond to e-mails ... I feel lost in my progress. I came to graduate school with a very clear research project, full of confidence and inspiration, and now all of that has fallen apart. ... It isn’t all completely dismal—I like a lot of the people in my program, and there are some people on my committee who have taken time for me and seem to genuinely care.”*

*“Many faculty are utterly unaware of the current academic job market and of the precarious financial situation graduate students find themselves in.”*

*“I feel that professors should be required to take courses on mentorship and management.”*

*“Advisors need training in how to be better mentors!”*

*“A less supportive adviser or department culture would significantly impact my well-being. For example, I am aware of grad students who are afraid to discuss their weekend activities freely because their advisor frowns on the idea that they wouldn’t be in the lab working. A situation like that is outrageous, the GA should fight that kind of culture at every opportunity.”*

Most other items are significant predictors of well-being on an individual basis but not when the above items are included. Three items, awareness of health and mental health resources on campus, and substance use, are not individually predictive of life satisfaction or depression. A fourth question about funding sources is, in retrospect, not well-formulated for analysis.

## Other Important Findings

### 1. Demographics

In the current survey, lesbian, gay, bisexual and queer (LGBQ) students report significantly lower life satisfaction and higher depression. The difference for life satisfaction continues to be significant in that outcome’s top predictor model.

Parents and married students fare better than others, while older students and students of “other” race or ethnicity (as distinct from “mixed” race or ethnicity) fare worse<sup>2</sup>. Except with respect to parents, these differences do not persist in the top predictor models. Generally, traditional racial or ethnic categories are not predictive of well-being gaps, and we found no evidence of a gender well-being gap or gap for non-U.S. citizens.

Aside from our findings about LGBQ students, these results are fairly encouraging. More work remains, however, as older students and non-white students, particularly African-American and Native American/Alaska Native students, are less likely to feel valued and included in their departments and less likely to feel that their cultures are valued and respected. Interestingly, LGBQ students feel just as valued and included in their departments as their heterosexual or straight peers, but are less likely to feel that their culture is valued and respected. We did not find disparities in inclusion by gender or marriage, parent or citizenship status. Because happier people tend to be more inclusive, improving well-being may also improve campus climate<sup>3</sup>.

---

<sup>2</sup> Married students have higher life satisfaction, parents have lower depression, older students have lower life satisfaction and students of “other” race or ethnicity have lower life satisfaction as well as higher depression.

<sup>3</sup> As we circulated drafts of this report to stakeholder groups, we were asked a number of times by graduate students to examine intersectionality, or the way in which intersections of demographic categories like race and gender or marriage and parent status may produce distinct well-being outcomes, e.g. for African-American women or single parents. While we are quite receptive to this reasoning and we explored many intersections, it is difficult to systematically examine intersectionality, and we welcome input on this matter. With ten demographic variables and two primary well-being outcomes, taking two demographic variables at a time results in 90 intersections and hundreds of new average outcomes to examine. Further, many intersections produce small sub-samples that we are underpowered to analyze statistically. Along these lines, for example, we observe that African-American women have near-average (and perhaps better) well-being outcomes, while single parents have lower life satisfaction and near-average depressive symptoms, though differences are not statistically significant.

## 2. Degree Program

Ph.D. students have lower life satisfaction than Master's and Professional students and exhibit higher levels of depressive symptoms. About 47% of Ph.D. students reach the threshold considered depressed, a 10 out of 30 on the depression scale. Master's students, while better off than Ph.D. students, still score as depressed about 37% of the time. It is important to note that these are not clinical diagnoses and that many factors may influence the estimates. For example, depressed students may complete the survey at a different rate, and people who enter certain programs may exhibit different levels of well-being to start, leading to possible selection biases (in either direction). Still, these estimates are concerning.

What might explain the gap in life satisfaction and depression between Ph.D. and Master's students? In general, Ph.D. students feel less upbeat about their career prospects, less on-track academically and less prepared for the work they need to do. They're less likely to feel valued and included in their departments, and less likely to say they have the space and resources they need to succeed. We observe no differences between Ph.D. and Master's students in health, living conditions, engagement with their work, financial confidence or social support. Ph.D. students get more sleep and more exercise than Master's students, which suggests they take more steps to address their well-being than Master's students. Master's students are less satisfied with the mentorship and advising they receive.

*"I never thought that getting a doctorate would involve working in a vacuum with little or no input or support."*

*"My days feel very scattered. A meeting, a class, a grant proposal to write, theory to read—I find it hard to balance all the tasks and not feel crazy. Sometimes it feels like the work is so all over the place and there's no organized way in which I am held accountable for it."*

*"One of my biggest challenges as a graduate student is negotiating unspecified expectations. The idea that I could always be doing more work tends to loom. The further I have gotten in my program, the more nebulous my work expectations as expressed by my faculty and department have become."*

*"My department does a poor job of educating us about/preparing us for careers outside of academia. The general assumption ... is that we will go on to do postdocs, which is the wrong choice for many people. The help I've gotten in this regard (Beyond Academia, Careers for Life Science PhDs) are the products of grad students and postdocs organizing events for themselves because the department/university did such a poor job."*

## 3. Field of Study

The picture looks bleak for graduate students in the Arts & Humanities, where 64% of students reach the threshold considered depressed. Between 43-46% of graduate students in Biological Sciences, Physical Sciences, Engineering and "Other Professional" score as depressed, while 37% of Law, 34% of Social Sciences and 28% of Business students score as depressed. Life

satisfaction is lowest among the Arts & Humanities and highest among “Other Professional,” Business and Social Sciences students.

Interestingly, Arts & Humanities and Social Sciences students give the highest ratings to their advisors, though they are the least likely to say they have the space and resources they need to succeed. In contrast, Law and Business students report the worst advising. Financially, students in Business, Physical Sciences and Engineering are doing the best, and students in Arts & Humanities, Law and Social Sciences are doing the worst. Students in the Arts & Humanities feel the worst about their academic progress and preparation as well as their career prospects, and Law and Business students feel the best.

*“Fighting for adequate funding is a problem I share with all of my colleagues in the humanities, and this has to change. We should be admitting far fewer graduate students, and we should be much clearer about how additional funding can be obtained.”*

#### **4. City of Residence**

Living conditions play an important role in graduate students’ well-being. Most students live in Berkeley (65%), but significant portions live in Oakland (13%), San Francisco (6%) and elsewhere (16%). Students who live in Oakland are less satisfied with their living conditions, feel less safe where they live and feel more financially insecure. Students in San Francisco are doing the best on these measures, with students in Berkeley in between. Other cities receive a wide range of marks.

#### **Comparison to 2004 Survey**

The last major survey of graduate student well-being at Berkeley occurred a decade ago, in the Spring semester of 2004<sup>4</sup>. Though the survey had a somewhat different focus on emotional distress as well as awareness and utilization of mental health services, it too highlighted the importance of financial confidence, social support and the advisor relationship to graduate student well-being. Notably, women, Asians, Master’s students and Humanities students were the most likely to report emotional distress in 2004. In contrast, in 2014, we observe no well-being gender gap or gap for Asian/Pacific Islander students and find that Ph.D. students fare worse than Master’s students. In line with 2004, students in the Arts & Humanities continue to have the lowest well-being outcomes. In 2014, we also find that graduate students express less awareness of mental health resources than health resources on campus.

The differences we observe between 2004 and 2014 may be due to the passage of time, random chance as well as to the use of different measures. The emphasis on reports of distressing emotions in 2004, for example, may have exaggerated the appearance of a gender gap in well-being because women tend to report more emotions than men generally. In 2014, we deploy validated measures of life satisfaction and depression.

---

<sup>4</sup> Hyun, J., Quinn, B., Madon, T., & Lustig, S. (2006). Graduate Student Mental Health: Needs Assessment and Utilization of Counseling Services. *Journal of College Student Development*, 47(3), 247-266.

### III. Recommendations

This report is a small step in what we hope will be a greater effort within the University community to address graduate student well-being with new policies, resources and research. Success in graduate school is dependent on the ability to perform at a high level repeatedly over multiple years, which entails some costs. Effortful mental work is resource-intensive for the body and cognitive strain is often associated with decreases in mood which, absent adequate support, could lead to depression over time. This report identifies important factors that support and predict graduate student well-being, which suggests a path forward for the University community to enable graduate students to perform well and do their best work.

#### 1. Follow the Roadmap Provided by the Top Predictors

The 10 top predictors provide a guide for the University community to improve well-being outcomes for graduate students. Improving students' feelings about their career prospects may involve doubling-down on efforts to help graduate students understand and prepare for career opportunities available to them, especially "beyond academia." Improving health may include bringing health and preventive health resources closer to students, such as providing flu shots inside department walls, and devoting more resources to sanitizing common areas. Similarly, improving sleep could involve training about the dynamics of arousal and sleepiness, strategies for optimizing sleep and prioritizing tasks to make room for sleep to occur, and expanded testing for sleep disorders. As with many of the top predictors, helping students get adequate sleep may also entail a cultural shift for some departments.

On average, graduate students feel concerned about their finances. Intertwined with finances in the Bay Area are living conditions, which are another important predictor of graduate student well-being. Given the importance of finances and living conditions to well-being, the University should work to shore up the low student funding of some departments. The University should also consider helping incoming graduate students locate affordable, safe and attractive housing, whether in Berkeley or in surrounding communities, given that decisions often have to be made hastily and with little awareness of the options that may be available.

A targeted initiative on academic progress, preparation and engagement might help departments clarify milestones, break up milestones into more manageable tasks or well-spaced deadlines, and improve coursework meant to provide the practical methodological or other skills that enable graduate students to complete their research and other work. To improve engagement with their work, departments should help graduate students develop projects they find personally compelling and meaningful. Departments should also address student concerns about having the space and resources they need to succeed.

Students strongly recommended the University community work to provide a variety of regular social activities for graduate students arranged around hobbies, health and identity, including more regular gatherings for students of color, LGBTQ students, parents and others. Support groups akin to the Thriving in Science group were another suggestion, as were more social gatherings for the graduate student body as a whole. Because graduate students do not identify

with undergraduates, and often teach them, building a greater sense of community and reserving space specifically for graduate students should be a high priority.

*“I appreciate the GA’s efforts to coordinate social events. I would suggest that the GA also consider organizing or sponsoring broad field-based social events (e.g. humanities, physical sciences, social sciences, etc.) to increase possibilities for socializing and networking with students in related disciplines.”*

*“As a graduate student who’s also a parent, I’d love it if there were more activities for new parents on campus (like a support group for new moms, or exercise class for mothers and babies). I’d also appreciate if there was in general more support and recognition of students who juggle studies and family.*

*“A support group is very important. It helps to know that other people are also struggling and trying to get through a PhD program.”*

*“I feel like there isn’t enough in the beginning of graduate school here to really highlight opportunities to stay involved on campus—most things seem relevant for undergrads only.”*

*“It would be nice to have a recognized space on campus for doctoral students to work/sleep/study/commingle with no hassle access to resources.”*

*“We need more graduate-only space to use—we share our facilities with undergrads, which is understandable given that we are at a university, but areas should be for grad students only.”*

Further, given that advisors play such an important role in all of the above factors, specific required trainings should be considered to help faculty improve their mentorship and advising skills for Master’s and Ph.D. students, and mentorship should be a part of promotion and tenure decisions. Finally, because graduate student well-being does not exist in a vacuum and is in many ways dependent on the vision, creativity and effectiveness of faculty, administrators and staff, University policy should address and support the well-being of these communities, too.

## **2. Promote Well-Being Strategies Recommended by Students**

The University community can amplify the efforts students already make to maintain and improve their well-being, including making popular activities more widely available, removing barriers, eliminating fees, establishing casual drop-in courses and creating social activities around them. When asked what they do for their well-being or what they would recommend to other students, about 43% of the 502 responses mentioned a form of exercise, and 40% mentioned maintaining hobbies or leisure activities. About 30% of students also emphasized the importance of social support, partners, family and social or group activities.

Other popular recommendations included spending time outdoors (50 comments), yoga (42), getting adequate sleep (41), meditation (30), watching TV (29), cooking (26), religious or spiritual practice (21), playing or listening to music (19), spending time with a dog or other pet (19), counseling or therapy (16), reading (16), and drinking moderately, especially wine (9).

Because of their popularity, time outdoors, yoga, meditation, TV and cooking could serve as potential new social outlets for graduate students. For example, the University could recruit a celebrity chef to host evening courses on cooking and healthy eating. Therapy, which provides needed support to many graduate students, should also be made more widely available and more on-demand (e.g. non-emergency drop-in counseling). High-quality well-being apps, like Calm for iOS and Android, should be made freely available with other software provided by IST.

*“Meditation works wonders to help anxiety. Ten minutes a day has vastly improved my ability to focus and not engage in obsessive thinking.”*

*“Running I strongly recommend.”*

*“I believe in a lot of time spent outdoors.”*

*“Taking time off before bed.”*

*“Cook real meals.”*

*“Music, chess, literature, video games, movies, hanging out with friends. I’m currently five years into the program and I think the main thing that I do now better than I did at the beginning is making sure to keep a variety of things in my life.”*

*“Take advantage of counseling, this has gotten me through MANY problems with my advisers, colleagues and general stress from the graduate school process.”*

*“Therapy is great. We have to bring down the stigma around it.”*

### **3. Employ the Insights of Behavioral Economics to Enable Beneficial Behaviors**

An important lesson from the field of behavioral economics is that merely convincing someone of the desirability or importance of an action is often not enough to bring about that action. Most students are no doubt aware of the benefits of sleep, exercise, healthy eating, getting a flu shot and so on, and most students no doubt desire these things—but they don’t always follow through on their desires. One strategy from behavioral economics is to seek out and eliminate “hassle factors,” which are those things that put up small but surprisingly consequential barriers to carrying out desired behaviors. For example, when it comes to promoting exercise, this strategy implies that fees for facility use should be incorporated entirely into the tuition and fees students pay at the start of the semester and that separate fees or bureaucratic steps for facility use should be eliminated, as this year’s Wellness Fee Referendum proposes to do.

It’s important to think broadly about hassle factors. Staying with our exercise example, other hassles include simply the effort that must be expended to find answers to questions like, “Where are facilities located?” “When are they open?” “What classes are offered?” “Are they drop-in?” “How do I enroll?” “Is there a fee?” Small interventions like sending mail to students with answers to these questions each semester would not only remind them to exercise, but help remove these hassle factors. The idea of bringing flu shots to departments themselves would eliminate the hassle factor of walking to the Tang Center. Mailing students a map of CPS

locations for graduate students and drop-in triage hours would increase utilization of therapy. Email may work, but students are inundated with email; further, small amounts of physical mail convey importance and, laying around, can be a handy reminder of the desired behavior.

#### **4. Start a Dialogue**

When we asked graduate students for feedback on the survey itself, the most common response was one of thanks. Students are hungry for a conversation about happiness and well-being in graduate school and efforts the University administration and individual departments make to have that conversation are likely to be welcomed. Students can also take matters into their own hands—and many have—by leading discussions within their own departments and bringing findings to their department administrators and faculty. Students appreciate when people in positions of authority take an interest in their personal well-being.

*“I didn’t realize that there was an emphasis on ‘graduate well-being’ at UC Berkeley. It’s nice to know that the school cares. I hope it manifests itself better in the daily interactions graduate students have with professors and administration.”*

*“Thanks for doing this, I feel like this survey addresses a lot of important issues that have affected my life over the last five years.”*

*“I love that someone has taken the time to conduct this survey—I hope there’s some action that comes of it.”*

#### **5. Institutionalize the Survey & Promote Further Research**

We recommend deploying and analyzing this survey bi-annually to assess graduate student well-being over time and our progress in addressing it. We recommend institutionalizing the survey at Graduate Division. This will require a commitment of staff time as well as financial resources, particularly to increase response rates by, for example, sending mail to selected participants with the short survey link, calling to remind them, and increasing the financial incentives. The bi-annual survey will benefit from continued collaboration with the Graduate Assembly through the Director of Graduate Student Wellness, and the survey should evolve with feedback from stakeholders. New items or modules should be developed to investigate well-being topics such as career prospects in greater depth.

In addition, further research should be incentivized, especially randomized controlled trials whose outcomes can be evaluated as part of the bi-annual survey. One experimental intervention, for example, might randomly select 100 incoming graduate students for a housing program that assists them in seeking comfortable and affordable housing. Then, comparing their well-being and satisfaction with their living conditions to a control group in the bi-annual survey, we can evaluate the effectiveness of the experimental intervention. Of course, all randomized controlled trials will need to be carefully designed and controlled. We recommend that a funding and review mechanism be instituted that considers proposals from within and outside the University for research into improving graduate student well-being at Berkeley.

## IV. Survey Development, Deployment & Analysis

As stated above, our goal with this first survey was to be comprehensive of the major known causes of well-being, specific to the graduate student experience at Berkeley, and concise. Survey development began in the Spring semester of 2012 and proceeded in consultation with Graduate Division, Graduate Council and the Chancellor's Advisory Committee on Student Mental Health. We held a focus group with graduate students in the Spring semester of 2013 to explore well-being opportunities and concerns in-depth, and studied past efforts, including the 2004 survey. This consultation process bolstered many of the items we had planned to include and produced several new items, including questions of personal safety, cultural inclusion and, for parents, balancing work and family. Our protocol was submitted to and approved by CPHS.

Our full working model of graduate student well-being includes two dependent variables, satisfaction with life and depression, and 40 independent variables, including 30 candidate predictors and 10 demographic items. Satisfaction With Life (SWL), a 5-item scale, is among the most widely-used well-being measures and is an assessment of happiness and positive functioning<sup>5</sup>. It is important to include a measure of positive functioning and mental health as well as dysfunction or mental illness. Our depression scale is a 10-item shortened form of the Center for Epidemiologic Studies Depression Scale (CES-D), which is widely used in psychiatric epidemiology<sup>6</sup>. SWL and CES-D correlate significantly in our sample ( $r = .55$ ).

Graduate Division administered the survey to a stratified random sample of 2,500 graduate students, with oversampling among underrepresented minority students. The survey was administered via email and open for about six weeks, from March 12 to April 22, 2014, including Spring Break. A random drawing of over \$500 worth of prizes was offered as an incentive. We received 790 completed surveys for a response rate of 32%, which is average for surveys of graduate students. Because it is important that our findings be as representative of the graduate student population as possible, future surveys should experiment with additional ways to increase the response rate. Publicizing the results of this study may help.

Construction of our final model of top well-being predictors proceeded in three steps. First, we conducted factor analysis, looking to see if conceptually related items might form scales for use in prediction. Safety, financial, advisor, academic and inclusion scales were developed as a result. Second, we put all scales and remaining items into two Type-III ANOVAs, one per dependent variable. Most of the items in our two final models came out of this process. Finally, all significant predictors for each dependent variable were placed into separate regressions using standardized beta coefficients and all previously non-significant items were rotated through in a couple of iterations to find additional predictors. Academic engagement was added to both models as a result of this process. In addition, most scales were removed as we often found that single items within scales were most predictive.

---

<sup>5</sup> Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with Life Scale. *Journal of Personality Assessment*, 49, 71-75.

<sup>6</sup> Radloff L.S. (1977). The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.

### 1. Satisfaction With Life

Our final model for satisfaction with life includes eight single items and one scale, the academics scale, which includes our academic progress and preparation items. The model also includes fields of study, which are omitted for length. Note that the number of observations is lower here because many students reported no advisor and thus were excluded. Removing the advisor item increases the number of observations and the significance of all variables.

Source	SS	df	MS			
Model	564.534252	16	35.2833907	Number of obs =	650	
Residual	650.887295	633	1.02825797	F( 16, 633) =	34.31	
				Prob > F	= 0.0000	
				R-squared	= 0.4645	
				Adj R-squared	= 0.4509	
				Root MSE	= 1.014	
Total	1215.42155	649	1.87276047			

Life_Satisfaction	Coef.	Std. Err.	t	P> t	Standardized Coef.
living_conditions	.1801513	.0284533	6.33	0.000	.2006304
career_prospects	.1473015	.0283634	5.19	0.000	.1946877
financial_confidence	.1007775	.0252794	3.99	0.000	.1431678
academics_scale	.1357765	.035552	3.82	0.000	.1373098
health_overall	.2181703	.0535076	4.08	0.000	.1351631
academic_engagement	.0822497	.0259009	3.18	0.002	.1019357
valued_included	.0892507	.0306602	2.91	0.004	.1005938
advisor_mentor	.0663182	.0240544	2.76	0.006	.0918737
social_support	.114045	.0446979	2.55	0.011	.0788238
fields_of_study					
_cons	-.2746646	.2690878	-1.02	0.308	.

### 2. Depression

Our final model for depression includes seven single items and one scale, the academics scale. Again, the model includes fields of study, which are omitted for length.

Source	SS	df	MS			
Model	9789.00793	15	652.600528	Number of obs =	785	
Residual	14221.6035	769	18.4936327	F( 15, 769) =	35.29	
				Prob > F	= 0.0000	
				R-squared	= 0.4077	
				Adj R-squared	= 0.3961	
				Root MSE	= 4.3004	
Total	24010.6115	784	30.6257799			

Depression	Coef.	Std. Err.	t	P> t	Standardized Coef.
sleep	-.576226	.0941986	-6.12	0.000	-.1833234
health_overall	-1.171919	.2153791	-5.44	0.000	-.1774891
academic_engagement	-.5419894	.0991794	-5.46	0.000	-.1643513
social_support	-.9769895	.1750243	-5.58	0.000	-.1637757
career_prospects	-.4769041	.1122504	-4.25	0.000	-.1536984
financial_confidence	-.2741222	.0986367	-2.78	0.006	-.0956508
academics_scale	-.3179119	.1401744	-2.27	0.024	-.0782668
living_conditions	-.2609093	.1109923	-2.35	0.019	-.0717979
fields_of_study					
_cons	29.55045	1.037916	28.47	0.000	.

Our sample of completed surveys was 54% female, had an average and median age of 28, was 48% White, 30% Asian/Pacific Islander, 11% Hispanic, 4% African-American, 1% Native American, and 6% of other race/ethnicity. About 11% identify as LGBTQ, 35% are married, 13% are parents and 33% are non-U.S. citizens. Because respondents were able to select multiple racial/ethnic categories as well as an “other” option, we analyzed race and ethnicity both with and without a designated “mixed” race/ethnicity variable. About 9% of graduate students selected more than one racial or ethnic category. Mean outcomes for life satisfaction and depression are similar across racial/ethnic groups using both categorization methods, with some limited evidence in both that students of “other” race/ethnicity have worse outcomes.

More women are included in our sample of completed surveys than in the graduate population as a whole (54% vs. 45%), as reported by Graduate Division<sup>7</sup>, and we have about 10% more underrepresented minorities as a result of our oversampling there. Average age is the same and about 67% of our respondents are Ph.D. students, though they account for only 56% of the overall graduate student population. Because there were few significant well-being differences across demographic categories like gender and race/ethnicity (except for LGBTQ students for whom there are no public statistics), we did not weight for these variables in our analysis.

We also generally do not weight figures by field, though there were well-being differences across them (field is included in the top predictor models, however). We were concerned that different response rates by field might affect reported levels of depression among Ph.D. and Master’s students, however rough weighting by field of study did not change the proportion of Master’s students designated as depressed, and only shifted the percentage of Ph.D. students designated as depressed down by 1%. We report the weighted number, 47%, above. We included broad rather than granular field designations in this survey in an effort to preserve anonymity.

## Future Surveys

Survey respondents and other stakeholders with whom we consulted in preparation for the release of this report have made a number of suggestions for adding to or improving the survey. We should consider incorporating these ideas in the next survey, space permitting, and continue to evolve the set of questions based on the needs of research and the community, balancing granularity with the need to preserve anonymity and/or confidentiality.

New question ideas are below, grouped roughly according to our original substantive areas.

### Satisfying Basic Human Needs

How many roommates do you currently live with? (Does this include a significant other?)

How many miles do you travel to campus from your home? How long is the commute?

“Overall, I’m satisfied with my housing situation.” Strongly disagree, ..., Strongly agree

About how much debt do you currently have in loans from graduate school? Undergraduate?

Current credit card debt?

About what time did you go to bed over the past week, on average?

---

<sup>7</sup> See “Berkeley Graduate Profile, 2013-14,” [http://grad.berkeley.edu/wp-content/uploads/berkeley\\_grad\\_profile.pdf](http://grad.berkeley.edu/wp-content/uploads/berkeley_grad_profile.pdf)

Would you say you fall asleep and wake up at consistent times every day, or that it varies?

### **Succeeding Academically**

“My academic work is meaningful and inspires me.” Strongly disagree, ..., Strongly agree

“I am receiving / have received adequate preparation for careers in my field.”

Would you say your day-to-day work is cognitively easy or straining? Very easy, ..., Very straining

Are you a GSI, GSR or Reader? How many hours per week do you work?

Do you have other employment? (Specify.) How many hours per week do you work?

How often do you meet with your advisor? Weekly, Monthly...

“My advisor is aware of and open to discussing career opportunities outside of academia.”

“My advisor demonstrates concern for my well-being.” “... financial well-being.”

Overall satisfaction with advising and mentorship received at Berkeley

How often do you attend talks or research seminars on campus? Weekly, Monthly...

For PhDs: “Given norms in my field, I have a solid publishing record for my career stage.”

“I intend to pursue a career in academia.” Yes, No

### **Climate & Belonging**

“I’ve experienced or witnessed a significant instance of bias, discrimination or harassment in my department/during my time as a graduate student at Berkeley.” Yes, No, Unsure

“I’m confident that I would not face retaliation in my department for reporting an instance of bias, discrimination or harassment.” Strongly disagree, ..., Strongly agree

Have you ever been sexually harassed by a peer? By a faculty member? Staff member?

### **Well-Being Maintenance**

Have you sought counseling or mental health services while a graduate student? On-campus, Off-campus, Both. If so, how satisfied are you with the quality of care you received? Very dissatisfied, ..., Very satisfied. About how long did you have to wait to be seen? (Days)

How connected do you feel to other graduate students in your department? At Berkeley?

About how many days in a typical week do you: Drink alcohol? Use tobacco? Cannabis?

“I am getting plenty of fresh fruits and vegetables in my diet.”

Do you regularly engage in any of the following practices? Mindfulness/meditation, yoga, sports, time outdoors, cooking meals, caring for a pet, religious or spiritual practice, music, making lists or prioritizing tasks.

### **Demographics**

What year are you in your studies? For PhDs: Have you advanced to candidacy?

Option to specify dual degree

Are you currently pregnant?

Have you ever served in the military?

Option to write in a response whenever an “Other” option is listed (esp. for Race/Ethnicity)

Have you been homeless during your graduate studies? Yes/Current, Yes/Past, No

Do you have allergies? Seasonal, Food, Other (specify)

Do you have a disability? Chronic medical condition? Chronic mental illness?

Would you describe yourself as significantly overweight, ..., significantly underweight?  
Do you receive any government social services? Food stamps ... Other (specify), None  
Did you work between your undergraduate and graduate studies?

### **Open Response**

Have you ever seriously considered dropping out of graduate school? Why?  
What would you say Berkeley does well with respect to graduate student well-being?  
How would you describe your relationship with your advisor? How satisfied do you feel overall with the advising and mentorship you've received as a graduate student at Berkeley?

Another suggestion we received was to craft separate survey branches for Ph.D. and Master's or Professional students, which would require a larger sample of Master's and Professional students and entail additional work to further flesh out the separate concerns of each group, for example in new focus groups. While it is important to preserve original wordings for items that we wish to track over time, we can experiment with new formulations or substantively expand upon top predictors like career prospects by adding new items or modules. We can also group items that were not top predictors but which we wish to track over time into rotating modules, making space to test new items.

Some students requested a progress bar, and we should attempt to make it clearer that the survey is anonymous and confidential. If in the future we wish to weight our data, we should determine categories and their population weights in advance.

## V. Annotated Questionnaire

Annotations are highlighted and did not appear in the survey.

---

### “How We’re Doing”

Graduate Student Well-Being Survey (2014)

This survey is part of a Graduate Assembly research initiative on graduate student happiness and well-being, working in partnership with the Graduate Division at UC Berkeley. Your responses are anonymous and will be reported with care to maintain your privacy and confidentiality. Though some questions are of a sensitive nature, please answer them as honestly as you can and to the best of your ability. If you have any questions, please contact [Name] at [Email].

Thank you for your time and for your participation in this research. Please click the button below to continue.

Note: Questions were not numbered. Page breaks are denoted by a horizontal rule.

---

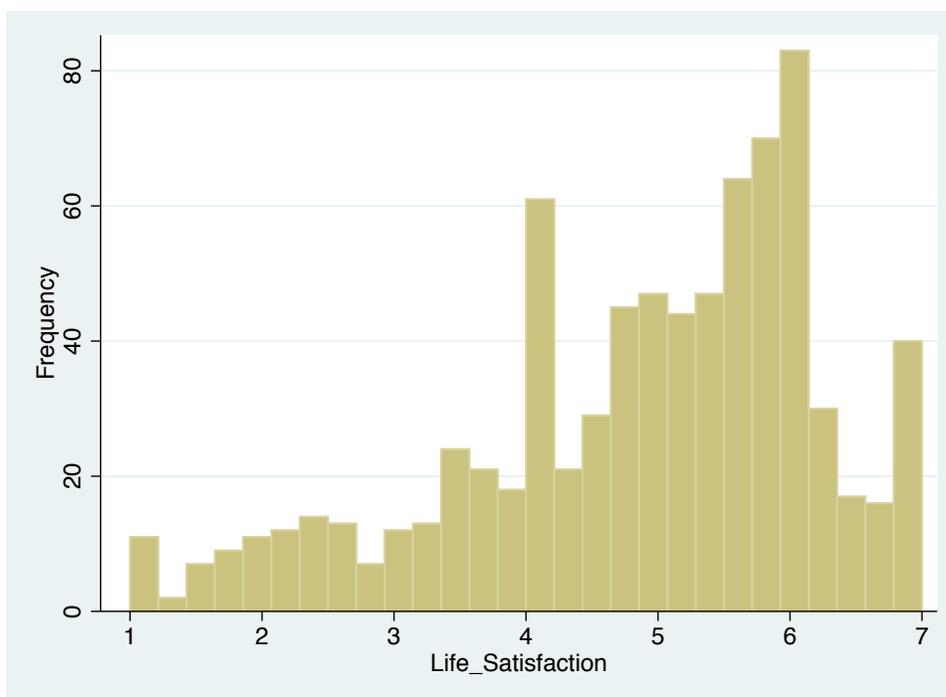
### Part 1 - Satisfaction With Life Scale

Below are five statements with which you may agree or disagree. Indicate your agreement or disagreement with each item by selecting the appropriate response in the corresponding row. Please be open and honest in your responding.

Mean: 4.8 (Slightly Agree)

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with life.
4. So far I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

*Strongly Disagree, Disagree, Slightly Disagree, Neither Agree nor Disagree, Slightly Agree, Agree, Strongly Agree*



## Part 2 - CES-Depression Scale

Below is a list of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during the past week by selecting the appropriate response in the corresponding row.

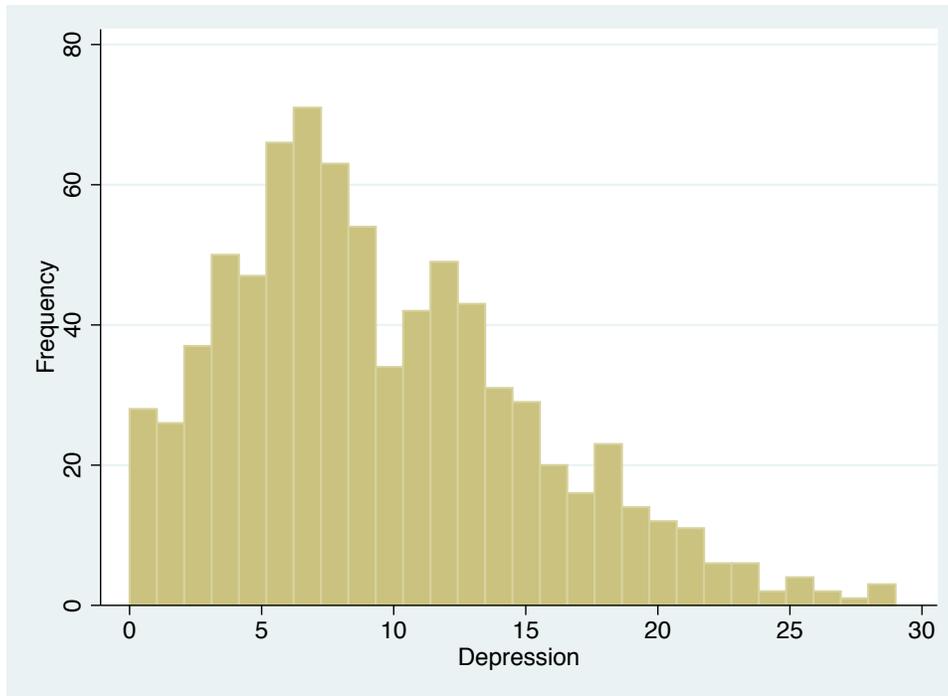
Mean: 9.7 (Some or a little of the time)

1. I was bothered by things that usually don't bother me.
2. I had trouble keeping my mind on what I was doing.
3. I felt depressed.
4. I felt that everything I did was an effort.
5. I felt hopeful about the future. (REVERSED)

(Instructions repeated)

6. I felt fearful.
7. My sleep was restless.
8. I was happy. (REVERSED)
9. I felt lonely.
10. I could not "get going."

*Rarely or none of the time (less than 1 day), Some or a little of the time (1-2 days), Occasionally or a moderate amount of the time (3-4 days), All of the time (5-7 days)*

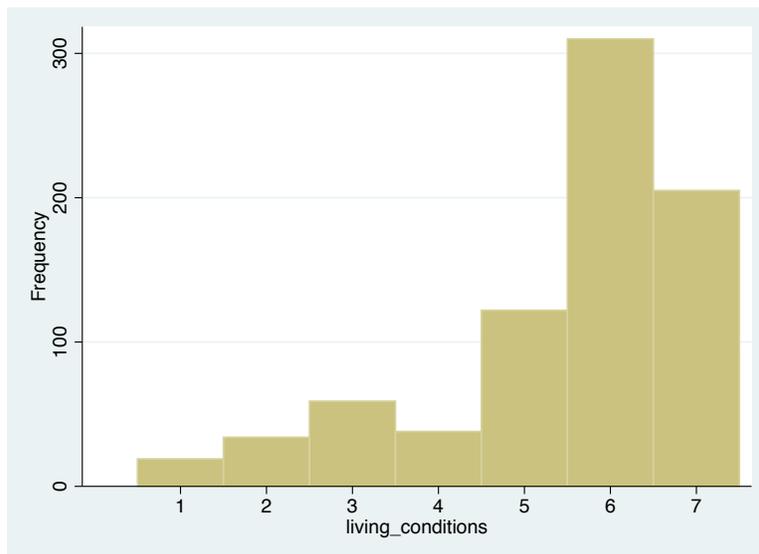


### Part 3 - Basic Human Needs

Below are statements with which you may agree or disagree. Indicate your agreement or disagreement with each item by selecting the appropriate response in the corresponding row.

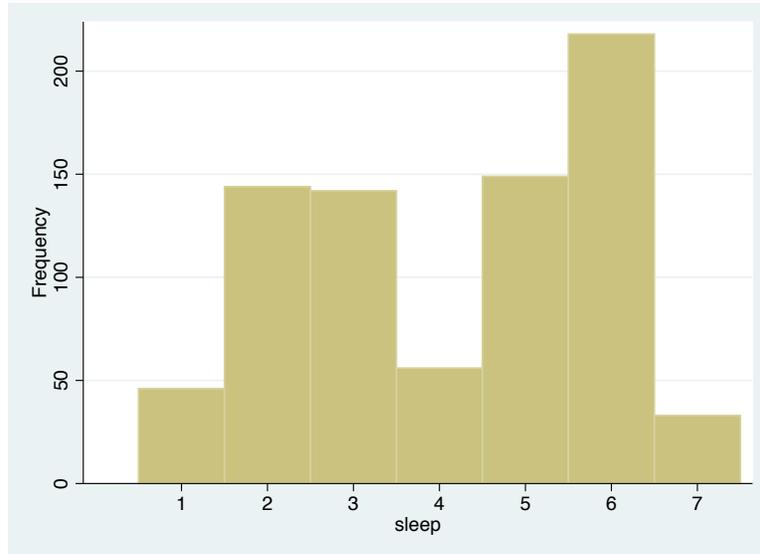
1. Where I live, I feel safe. 5.7 (Agree)
2. Where I live, I'm satisfied with my living conditions. 5.5 (Slightly Agree/Agree)
3. On campus, I feel safe. 5.7 (Agree)

*Strongly Disagree, Disagree, Slightly Disagree, Neither Agree nor Disagree, Slightly Agree, Agree, Strongly Agree*



4. Over the past week, I've been able to get enough sleep at night to feel fully alert and well-rested during the day. 4.1 (Neither Agree nor Disagree)

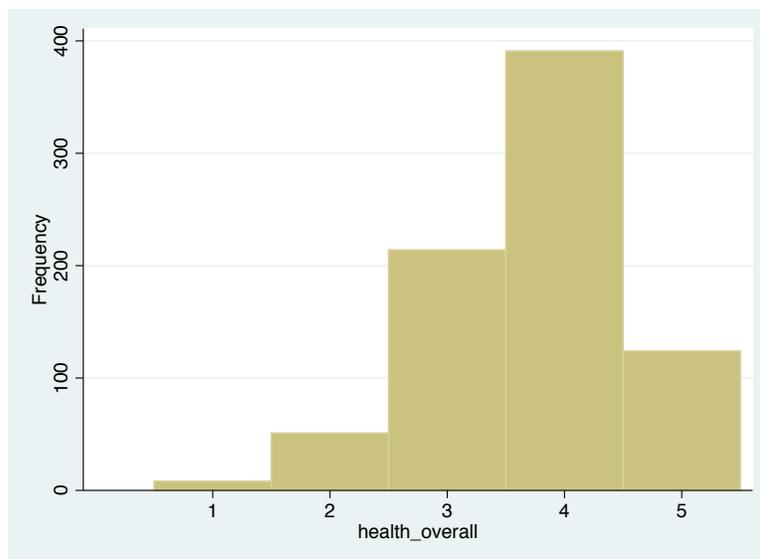
*Strongly Disagree, Disagree, Slightly Disagree, Neither Agree nor Disagree, Slightly Agree, Agree, Strongly Agree*



5. About how many hours of sleep were you able to get each night over the past week, on average? (Enter number of hours) 6.6 hours, 20% sleep 8 hours or more

6. How has your overall health been this semester? 3.7 (Good)

*Very Poor, Poor, Fair, Good, Very Good*

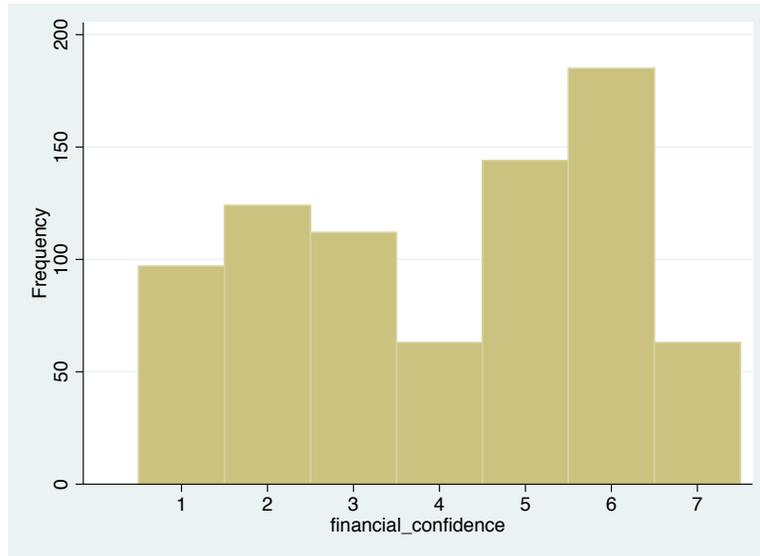


7. Have you been sick or ill this semester? 44% said Yes

*Yes, No*

Below are statements with which you may agree or disagree. Indicate your agreement or disagreement with each item by selecting the appropriate response in the corresponding row.

8. I'm confident about my financial situation. 4.1 (Neither Agree nor Disagree)



9. I can get by financially without having to cut back on too many of the things that are important to me. 4.3 (Neither Agree nor Disagree)

10. I've been concerned about money lately. (REVERSED) 3.0 (Slightly Agree)

*Strongly Disagree, Disagree, Slightly Disagree, Neither Agree nor Disagree, Slightly Agree, Agree, Strongly Agree*

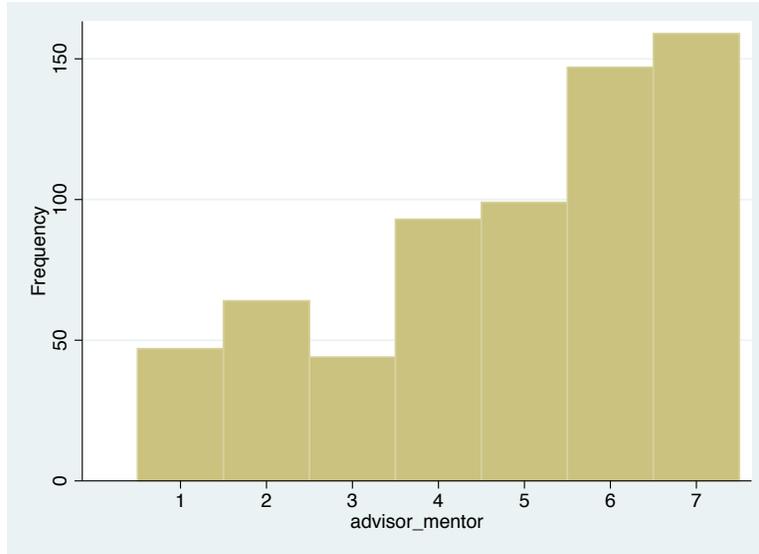
#### Part 4 - Succeeding Academically

My advisor...

11. is a real mentor to me. 4.9 (Slightly Agree)

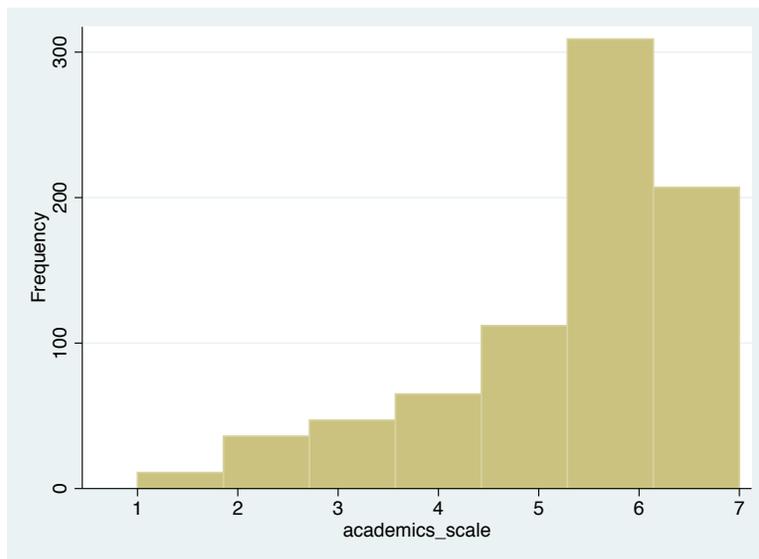
12. is an asset to my academic and professional career. 5.4 (Slightly Agree)

*Strongly Disagree, Disagree, Slightly Disagree, Neither Agree nor Disagree, Slightly Agree, Agree, Strongly Agree*

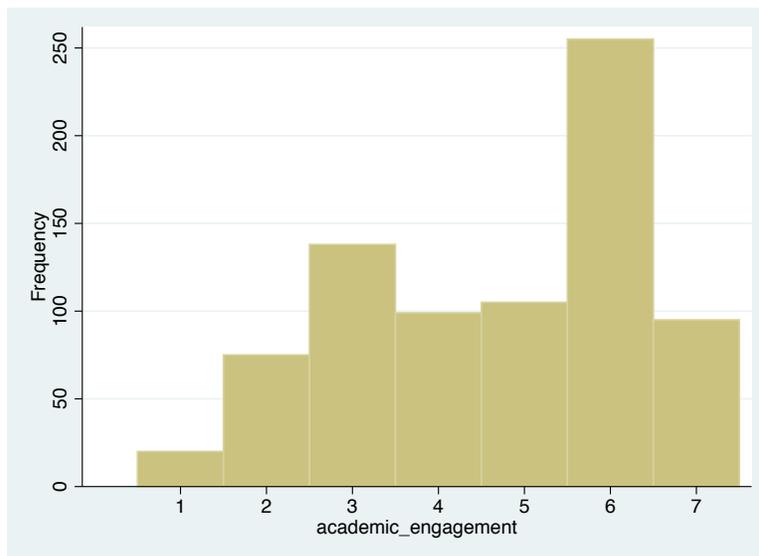
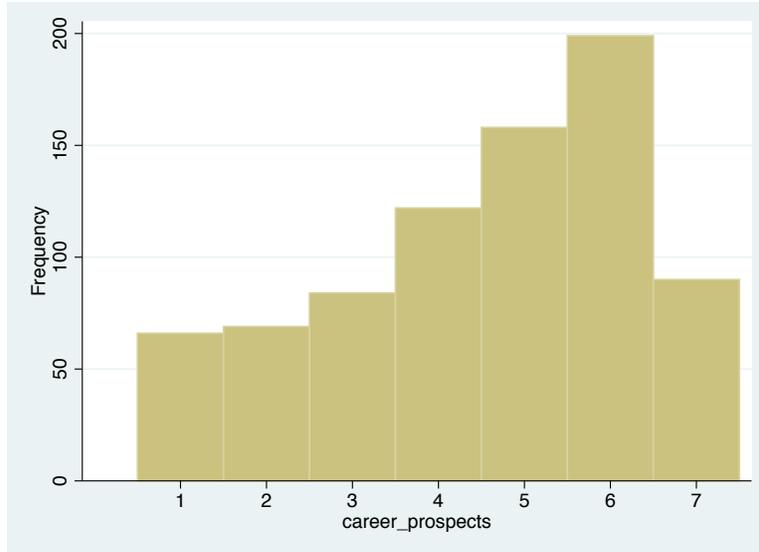


I'm...

- 13. On track to complete my degree program on time. 5.5 (Slightly Agree/Agree)
- 14. Well-prepared for the work required to complete my program. 5.4 (Slightly Agree)



- 15. Upbeat about my post-graduation career prospects. 4.5 (Neither/Slightly Agree)
- 16. Not very engaged by my day-to-day work. (REVERSED) 4.7 (Slightly Disagree)



17. I have the space and the resources I need in the university to succeed academically.

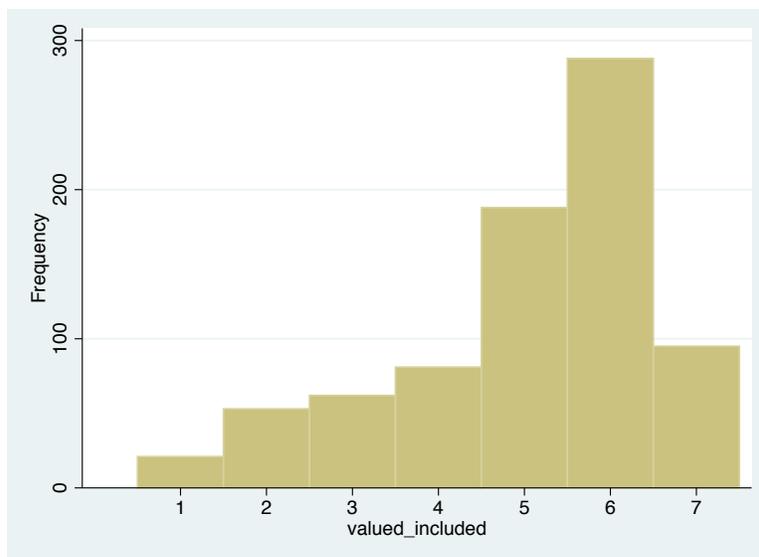
5.1 (Slightly Agree)

*Strongly Disagree, Disagree, Slightly Disagree, Neither Agree nor Disagree, Slightly Agree, Agree, Strongly Agree*

---

## Part 5 - Departmental Climate & Belonging

18. I feel valued and included by my peers, the administration and the faculty in my department. 5.0 (Slightly Agree)



19. I feel like my culture is valued and respected by my peers, the administration and the faculty in my department. 5.1 (Slightly Agree)

20. My department reduces hassles and paperwork to a minimum and frees me to focus on what's important. 4.8 (Slightly Agree)

*Strongly Disagree, Disagree, Slightly Disagree, Neither Agree nor Disagree, Slightly Agree, Agree, Strongly Agree*

## Part 6 - Well-Being Maintenance

I know where to get help on campus if I have a...

21. Health need. 5.8 (Agree)

22. Counseling, psychological or other mental health need. 5.5 (Slightly Agree/Agree)

*Strongly Disagree, Disagree, Slightly Disagree, Neither Agree nor Disagree, Slightly Agree, Agree, Strongly Agree*

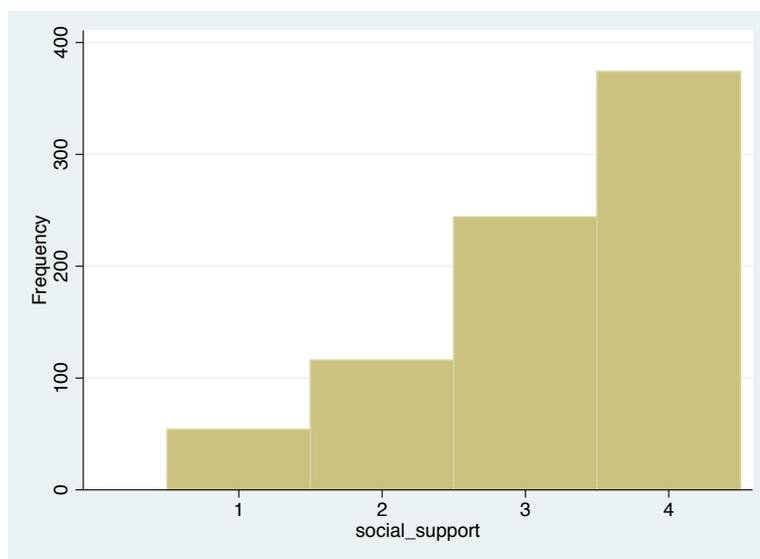
23. If I were sick, I could easily find someone to help me with my daily chores.

2.8 (Probably true)

24. I feel that there is no one I can share my most private worries and fears with.

(REVERSED) 3.2 (Probably false)

*Definitely false, Probably false, Probably true, Definitely true*



About how many days in a typical week do you...

25. Work out or get exercise **2.8 days**

26. Participate in social outings with friends or other opportunities for non-academic personal enrichment **2.0 days**

27. Drink alcohol, smoke cannabis or tobacco, or use other drugs **1.6 days**

1 day, ..., 7 days

28. What are some of the things you do to maintain your well-being? Is there anything you'd particularly recommend to other graduate students? A brief answer is fine.

502 responses. About 43% of responses mentioned a form of exercise and 40% mentioned maintaining hobbies or leisure activities. About 30% of students also emphasized the importance of social support, partners, family, and social or group activities. Other recommendations included spending time outdoors (50 comments), yoga (42), getting adequate sleep (41), meditation (30), watching TV (29), cooking (26), religious or spiritual practice (21), playing or listening to music (19), spending time with a dog or other pet (19), counseling or therapy (16), reading (16), and drinking moderately, especially wine (9).

29. If you're a parent or caregiver... I'm able to balance my work and family life.

**4.3 (Neither Agree nor Disagree)**

30. If you're a PhD student... I'm confident I'll have adequate funds to complete my research.

**4.8 (Slightly Agree)**

*Strongly Disagree, Disagree, Slightly Disagree, Neither Agree nor Disagree, Slightly Agree, Agree, Strongly Agree, Not Applicable*

---

## Part 7 - Achievement Orientation Scale

Note: Part 7 was removed from the analysis due to problems displaying the scale. The scale was originally included to explore whether achievement orientation is related to well-being.

*“The statements under ‘I often...’ didn’t show. Might be my computer, but might be worth checking out.”*

Below are ten statements with which you may agree or disagree. Indicate your agreement or disagreement with each item by selecting the appropriate response in the corresponding row. Please be open and honest in your responding.

### I often...

(Randomize)

1. Do more than what’s expected of me.
2. Accomplish a lot of work.
3. Excel in what I do.
4. Plunge into tasks with all my heart.
5. Do a lot in my spare time.
6. Do just enough work to get by. (REVERSED)
7. Hang around doing nothing. (REVERSED)
8. Shirk my duties. (REVERSED)
9. Find it difficult to get down to work. (REVERSED)
10. Need a push to get started. (REVERSED)

*Strongly Disagree, Disagree, Slightly Disagree, Neither Agree nor Disagree, Slightly Agree, Agree, Strongly Agree*

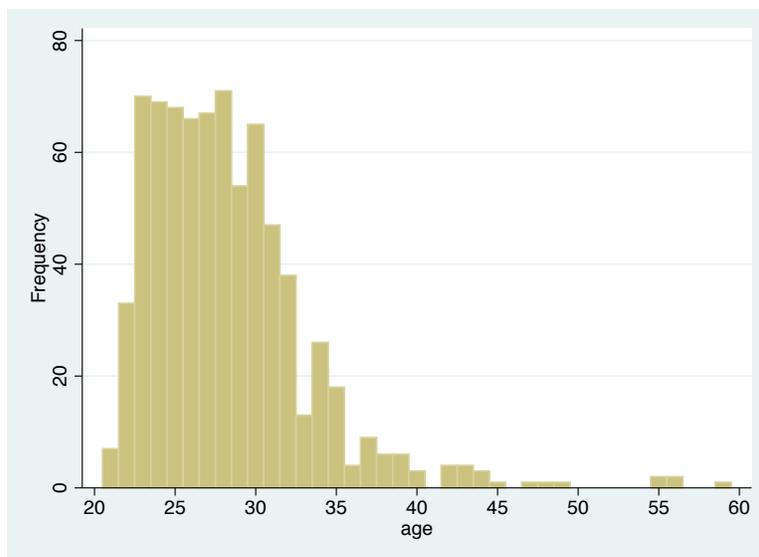
---

## Part 8 - Demographic & Open Response Questions

1. What is your gender? 54% female, < 1% trans or gender non-conforming

*Male; Female; Trans/Gender Non-conforming*

2. How old are you? 28 years old



3. What is your race/ethnicity? (check all that apply)

African American (4%); Asian, Pacific Islander (30%); Hispanic, Latino (11%); Native American, Alaska Native (1%); White (48%); Other (6%)

4. What is your sexual orientation? 11% LGBTQ

Gay, lesbian, bisexual or queer; Straight or heterosexual

5. Are you married or in a domestic partnership? 35% married

6. Are you a parent or caregiver? 13% parents

7. Are you a U.S. citizen or permanent resident? 77% citizens

Yes, No

8. What is your primary broad field of study?

Arts and humanities (19%); Biological sciences (12%); Physical sciences (10%); Engineering (17%); Social sciences (16%); Business (9%); Law (9%); Other professional (9%)

9. What is your degree program?

Doctorate (67%), Masters (MA, MS, MBA, MArch, LLM, etc.) (24%), JD (7%), OD (3%)

10. How are you primarily funding your studies and your living expenses this semester? Select up to two primary funding sources.

Grants (46%), Loans (22%), Wages from employment (24%), Tuition/Fee remission (24%), Personal savings (13%), Funding from parents (10%), Funding from employer specifically for education (5%), Other (11%)

11. What is your city of residence?

Berkeley (65%), Oakland (13%), San Francisco (6%), Other (specify) (16%)

---

12. We'd like to hear from you. If any thoughts or feelings occurred to you while taking this survey that you'd like to share, please take a moment now to do so. We're also interested in any ideas you may have for improving graduate student well-being. Write as much or as little as you'd like.

290 responses. Responses were varied, but financial concerns stood out as the largest theme (58 comments) followed by concern about loneliness and the need for greater social support, such as support groups and social activities (40). Concerns about mentorship and advising (24) and about career prospects (17) were two additional themes. Diversity and inclusion and counseling resources were also mentioned by several students.

---

13. If you have any feedback on the survey itself, please let us know here. The feedback you provide will be used to improve future versions of the survey.

140 responses. Students were generally quite positive about the survey overall and many thanked us for asking these questions. Many had useful suggestions for improving the survey.

---

Click submit below to complete. Thanks!

## Email Solicitation

From: CAVP-GA Departmental <cavp@ga.berkeley.edu>

Date: Wed, Mar 12, 2014 at 2:34 PM

Subject: Important Graduate Assembly Survey - Please Read (Win \$500 in Prizes)

The Graduate Assembly is conducting a short, 10-minute survey about graduate student well-being and you were selected to take it based on a random draw of all graduate students. We've thought hard about the questions to include and promise we won't waste your time. If you have a few minutes, [please take the survey now](#). We need your help. All responses are anonymous.

Our job as your advocates in the Graduate Assembly (GA) is to help enable you to do your best work here at Berkeley. There are a lot of things that go into well-being, but one thing that we know for sure comes out is your ability to perform at a high level in your pursuits here. This survey, called "How We're Doing," was developed in consultation with a number of stakeholders, including several students, to assess the overall well-being of graduate students at Berkeley so that we can better advocate for you.

To reduce the overall burden of this survey on graduate students, only a random selection of students are receiving an invitation to the survey. But this means that, because you received the invitation, we need you to take it. And by taking the survey, you'll be eligible for a random drawing for \$500 worth of prizes as a thank you for helping us get a better understanding of graduate student well-being. You could win a \$150 gift card to Chez Panisse, a Kindle Fire 7" HD Tablet (8 GB) or one of four \$50 Amazon gift cards.

Thank you for your time. Please [click here to continue to the survey](#).

John Ready  
Campus Affairs Vice President  
Graduate Assembly  
[cavp@ga.berkeley.edu](mailto:cavp@ga.berkeley.edu)

## Chapter 4.

# THE OBJECTIVE BENEFITS OF SUBJECTIVE WELL-BEING

JAN-EMMANUEL DE NEVE, ED DIENER, LOUIS TAY AND CODY XUEREB

**Jan-Emmanuel De Neve:** University College London and Centre for Economic Performance (LSE)

**Ed Diener:** University of Illinois and The Gallup Organization

**Louis Tay:** Purdue University

**Cody Xuereb:** Centre for Economic Performance (LSE)

*Corresponding author: Jan-Emmanuel De Neve (email: [j.de-neve@lse.ac.uk](mailto:j.de-neve@lse.ac.uk)). The authors thank Claire Bulger, John Helliwell, and Richard Layard for very helpful comments and guidance. This article was prepared, in part, as a contribution to the research undertaken for the forthcoming New Development Paradigm (NDP) report of the Royal Government of Bhutan. Financial support from the LSE Centre for Economic Performance, Emirates Competitiveness Council, Earth Institute (Columbia University), UK Department for Work and Pensions, and National Institute on Aging/NIH Grant RO1-AG040640 is gratefully acknowledged.*

## Introduction

The aim of this chapter is to survey the “hard” evidence on the effects of subjective well-being. In doing so, we complement the evidence on the determinants of well-being by showing that human well-being also affects outcomes of interest such as health, income, and social behavior. Generally, we observe a dynamic relationship between happiness and other important aspects of our lives, with influence running in both directions.

Although happiness is considered here as a *means* — rather than an *end* in itself — we do not imply that normative arguments for raising well-being are insufficient to make the case for well-being. However, a better understanding of the objective benefits of raising happiness may also help to put happiness more center-stage in policy making and to refine policy evaluation.

In the following sections we review the growing literature on the objective benefits of happiness across the major life domains categorized into (i) health & longevity; (ii) income, productivity, & organizational behavior; and (iii) individual & social behavior. Scientific research increasingly points to specific ways in which happiness generates tangible benefits. The experience of well-being encourages individuals to pursue goals that are capacity-building to meet future challenges. At the physiological level, positive emotions have been found to improve immune, cardiovascular, and endocrine functioning. In contrast, negative emotions are detrimental to these processes. Table 4.1 summarizes and categorizes the literature on the effects of subjective well-being.

Although high subjective well-being tends to help people function better, it is of course not a cure-all. Happy people do get sick and do lose friends. Not all happy people are productive workers. Happiness is like any other factor that aids health and functioning; with all other things being equal, it is likely (but not

guaranteed) to help. It is important to emphasize that research does not prescribe extreme bliss but, rather, tentative evidence suggests that a moderate degree of happiness tends to be “optimal” for the effects surveyed in this chapter.

Before concluding this chapter we also discuss *how* happiness may lead to better life outcomes and what its role may be in human evolution. There is initial evidence about the processes that mediate between happiness and its beneficial outcomes. For instance, positive feelings bolster the immune system and lead to fewer cardiovascular problems, whereas anxiety and depression are linked to poorer health behaviors and problematical physiological indicators such as inflammation. Thus, a causal impact of happiness on health and longevity can be understood with the mediating mechanisms that are now being uncovered. Research in the field of neuroscience provides further prospects for new scientific insights on mediating pathways between happiness and traits or outcomes of interest.

It naturally follows from this survey that it is important to balance economic measures of societal progress with measures of subjective well-being and to ensure that economic progress leads to broad improvements across life domains, not just greater economic capacity. Given the tangible benefits to individuals and societies of moderately high well-being, it is ever more urgent that we act to effectively put well-being at the heart of policy and generate the conditions that allow everyone to flourish.

Table 4.1: Summary of the objective benefits of subjective well-being

	<i>Benefits</i>	<i>Evidence</i>
<i>Health &amp; Longevity</i>	<ul style="list-style-type: none"> <li>• Reduced inflammation</li> <li>• Improved cardiovascular health, immune &amp; endocrine systems</li> <li>• Lowered risk of heart disease, stroke &amp; susceptibility to infection</li> <li>• Practicing good health behaviors</li> <li>• Speed of recovery</li> <li>• Survival &amp; longevity</li> </ul>	<ul style="list-style-type: none"> <li>• Adversity and stress in childhood is associated with higher inflammation later in life.<sup>1</sup></li> <li>• Positive emotions help cardiovascular, immune and endocrine systems,<sup>2</sup> including heart rate variability.<sup>3</sup> Evidence suggests a causal link between positive feelings and reduced inflammatory, cardiovascular and neuroendocrine problems.<sup>4</sup></li> <li>• Positive affect is associated with lower rates of stroke and heart disease and susceptibility to viral infection.<sup>5</sup></li> <li>• High subjective well-being is linked to healthier eating, likelihood of smoking, exercise, and weight.<sup>6</sup></li> <li>• Positive emotions can undo harmful physiological effects by speeding up recovery.<sup>7</sup></li> <li>• Happier individuals tend to live longer and have a lower risk of mortality, even after controlling for relevant factors.<sup>8</sup></li> </ul>
<i>Income, Productivity &amp; Organizational Behavior</i>	<ul style="list-style-type: none"> <li>• Increased productivity</li> <li>• Peer-rated &amp; financial performance</li> <li>• Reduced absenteeism</li> <li>• Creativity &amp; cognitive flexibility</li> <li>• Cooperation &amp; collaboration</li> <li>• Higher income</li> <li>• Organizational performance</li> </ul>	<ul style="list-style-type: none"> <li>• Individuals with induced positive emotions were more productive in an experimental setting.<sup>9</sup></li> <li>• Happy workers were more likely to be rated highly by supervisors and in terms of financial performance.<sup>10</sup></li> <li>• Happiness can increase curiosity, creativity, and motivation among employees.<sup>11</sup></li> <li>• Happy individuals are more likely to engage collaboratively and cooperatively during negotiations.<sup>12</sup></li> <li>• Well-being is positively associated with individual earnings.<sup>13</sup> Longitudinal evidence suggests that happiness at one point in time predicts future earnings, even after controlling for confounding factors.<sup>14</sup></li> <li>• Greater satisfaction among employees tends to predict organization-level productivity and performance, e.g. revenue, sales and profits.<sup>15</sup></li> </ul>

	<i>Benefits</i>	<i>Evidence</i>
<i>Individual &amp; Social Behavior</i>	<ul style="list-style-type: none"> <li>• Longer-term time preferences and delayed gratification</li> <li>• Reduced consumption &amp; increased savings</li> <li>• Employment</li> <li>• Reduced risk-taking</li> <li>• Pro-social behavior (e.g., donating money and volunteering)</li> <li>• Sociability, social relationships &amp; networks</li> </ul>	<ul style="list-style-type: none"> <li>• In experiments, individuals with higher well-being and positive affect are more willing to forego a smaller benefit in the moment in order to obtain a larger benefit in the future.<sup>16</sup> Happier individuals may be better able to pursue long-term goals despite short-term costs due to a greater ability to delay gratification.<sup>17</sup></li> <li>• Longitudinal studies find evidence that happier individuals tend to spend less and save more, take more time when making decisions and have higher perceived life expectancies.<sup>18</sup></li> <li>• Survey evidence shows the probability of re-employment within one year is higher among individuals who are happier.<sup>19</sup></li> <li>• The prevalence of seat-belt usage and the likelihood of being involved in an automobile accident were both linked to life satisfaction in a survey of over 300,000 US households.<sup>20</sup></li> <li>• Individuals who report higher subjective well-being donate more time, money, and blood to others.<sup>21</sup></li> <li>• Well-being increases interest in social activities leading to more and higher quality interactions.<sup>22</sup> Positive moods also lead to more engagement in social activities.<sup>23</sup> The happiness-social interaction link is found across different cultures and can lead to the transmission of happiness across social networks.<sup>24</sup></li> </ul>

Note: Further detail on each study cited in the table is included in the relevant sections of this chapter.

## Benefits of Happiness

### Happiness on health and longevity

There are many factors that influence health, such as having strong social support, and practicing good health behaviors, such as exercising and not smoking. Although being happy is only one of those factors, it is an important one. This is because higher levels of subjective well-being can both directly and indirectly influence health. Below we review the up-to-date research on whether happy people experience better health.<sup>25</sup>

Happiness and unhappiness have been directly associated with physiological processes underlying health and disease. For example, Kubzansky and colleagues find that adversity and stress in childhood predict elevated markers of inflammation a few years later.<sup>26</sup> And chronic inflammation that occurs over years can harm the cardiovascular system. Cohen et al. (2003) found that positive emotions were associated with stronger immune system responses to infection. Bhattacharyya et al. (2008) found that positive feelings were associated with healthier levels of heart rate variability. Negative emotions harm cardiovascular, immune, and endocrine systems in humans, whereas positive emotions appear to help them.<sup>27</sup> Levels of subjective well-being influence health, with positive levels helping health and negative levels harming it. Through an accumulation of studies, we are beginning to understand not just that subjective well-being influences health, but *how* this occurs.

Because subjective well-being influences physiological processes underlying health and disease, it is predictive of lower rates of cardiovascular disease and quicker recovery. For example, positive affect is associated with lower rates of strokes in senior citizens.<sup>28</sup> Davidson et al. (2010) found in a prospective longitudinal study that those without positive feelings were at a higher risk for heart disease than those with some positive feelings, who in turn had higher levels of heart disease than those with moderate positive feelings. Stress can even hinder wound healing after an injury.<sup>29</sup>

One indirect route from happiness to health is that individuals who are high in subjective well-being are more likely to practice good health behaviors and practices. Blanchflower et al. (2012) found that happier individuals have a healthier diet, eating more fruits and vegetables. Ashton and Stepney (1982) reported that neurotic individuals, people who are prone to more stress, are more likely to smoke. Pettay (2008) found that college students high in life satisfaction were more likely to be a healthy weight, exercise, and eat healthy foods. Schneider et al. (2009) found that happier adolescents, as assessed by brain scans of the left prefrontal area, showed a more positive response to moderate exercise. Garg et al. (2007) found that people put in a sad mood as part of an experiment were more likely to eat tasty but fattening foods, such as buttered popcorn, rather than a healthy fruit.

Using a large sample representative of the USA, Strine and her colleagues (2008a & b) found that depressed individuals are more likely to be obese and twice as likely to smoke, and parallel results were found for those with very high anxiety. Lack of exercise was associated with depression, and excessive drinking of alcohol was associated with anxiety. Grant et al. (2009) found, in a large sample across 21 nations, that higher life satisfaction was associated across regions with a greater likelihood of exercising and a lower likelihood of smoking. Kubzansky et al. (2012) found that distressed adolescents are more likely to be overweight. Thus, not only is there a direct biological path from happiness to healthier bodily systems, but unhappiness is also associated with destructive behaviors that can exacerbate health problems.

Another indirect effect of happiness, as will be described more fully in a next section, is that higher happiness can lead to more positive and fulfilling social relationships. And having these relationships promotes health.<sup>30</sup> For instance, the experience of prolonged stress can lead to poor health, but the presence of supportive friends and family can help individuals during this time. In contrast, lonely individuals experience worse health.<sup>31</sup>

An important concern with these research findings is that healthier people may be happier because of their good health, and not the other way around. While this may be true for some reported findings, scientific studies also show support for a link going from happiness to health. Research findings have established a link from happiness to better physiological functioning. Ong (2010) and Steptoe et al. (2009) review various possible explanations for the effects of positive feelings on health. Steptoe et al. (2005) found among middle-aged men and women that those high in positive feelings had reduced inflammatory, cardiovascular, and neuroendocrine problems. For instance, happiness was associated with a lower ambulatory heart rate and with lower cortisol output across the day. Similarly, Rasmussen et al. (2009) found that optimism predicted future health outcomes such as mortality, immune function, and cancer outcomes, controlling for factors such as demographics, health, and negative feelings. Boehm and her colleagues found that optimism and positive emotions protect against cardiovascular disease and also predict slower disease progression.<sup>32</sup> They discovered that those with positive moods were more often engaged in positive health behaviors, such as exercising and eating a nutritious diet. Furthermore, positive feelings were associated with beneficial biological markers, such as lower blood fat and blood pressure, and a healthier body mass index. These associations held even controlling for level of negative moods.

Another piece of evidence supporting happiness causing good health is that positive emotions can undo the ill-effects of negative emotions on health. Negative emotions generate increased cardiovascular activity and redistribute blood flow to specific skeletal muscles. It has been shown that positive emotions can undo harmful physiological effects by speeding physiological recovery to desirable levels.<sup>33</sup>

Diener and Chan (2011) reviewed eight types of evidence that point to a causal connection going from subjective well-being to health and longevity. They reviewed longitudinal studies with adults, animal experiments, experiments in which

participants' moods are manipulated and biomarkers are assessed, natural quasi-experiments, and studies in which moods and biomarkers are tracked together over time in natural settings. Diener and Chan (2011) concluded that the evidence overwhelmingly points to positive feelings being causally related to health.

Happiness on average leads not only to better health, but also to a longer life. Danner et al. (2001) found that happier nuns lived about 10 years longer than their less happy colleagues. Because the nuns all had similar diets, housing, and living conditions, and the happiness measure was collected at a very early age many decades before death (at age 22 on average), the study suggests a causal relation between positive moods and longevity. In another study, Pressman and Cohen (2012) found that psychologists who used aroused positive words (e.g., lively, vigorous) in their autobiographies lived longer. In a longitudinal study of individuals 40 years old and older, Wiest et al. (2011) found that both life satisfaction and positive feelings predicted mortality, controlling for socio-economic status variables. Conversely, Russ et al. (2012) reviewed 10 cohort studies and found that psychological distress predicted all-cause mortality, as well as cardiovascular and cancer deaths. Russ et al. (2012) found that even mild levels of psychological distress led to increased risk of mortality, controlling for a number of possible confounding factors. Whereas risk of death from cardiovascular diseases or external causes, such as accidents, was significant even at lower levels of distress, cancer death was only related to high levels of distress. Bush et al. (2001) found that even mild depression increased the risk of mortality after people had experienced a heart attack.

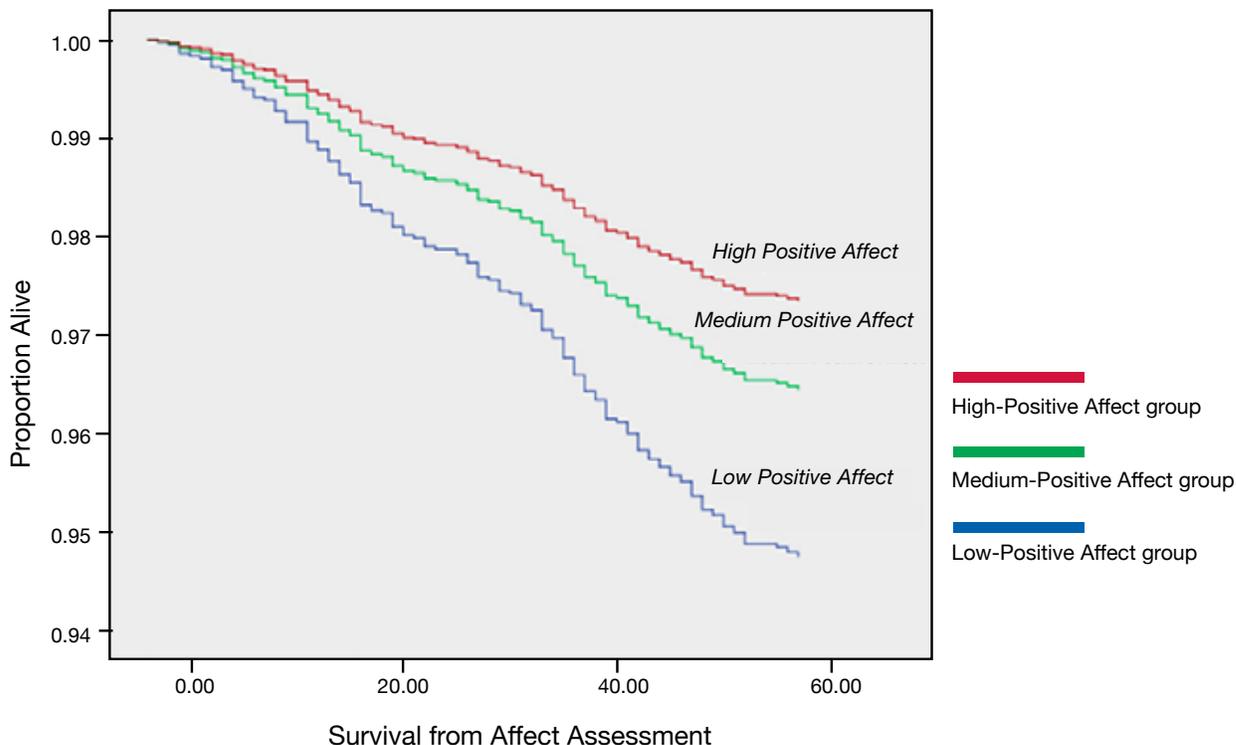
A systematic review by Chida and Steptoe (2008) on happiness and future mortality in longitudinal studies showed that happiness lowered the risk of mortality in both healthy and diseased populations, even when initial health and other factors were controlled. Moreover, the experience of positive emotions predicted mortality over and above negative emotions, showing that the effects of subjective well-being go beyond the absence of negativity.

Therefore, not only do negative emotions predict mortality, but positive emotions predict longevity. One reason this may be so, besides the toll that cardiovascular and immune diseases take on unhappy people, is that stress might lead to more rapid ageing. Epel et al. (2004) found shorter telomeres (the endcaps protecting DNA) in women who had significant stress in their lives. Because DNA must replicate with fidelity for an individual to remain healthy over the decades of life, and because the telomeres protect our DNA during replication, the reduction of telomeres due to stress leads to more rapid aging when a person chronically experiences unhappiness.

In a large representative sample of elderly people in the UK, Steptoe and Wardle (2011) found that higher levels of positive affect were significantly

associated with a higher probability of survival in the five years following the survey. The study divided respondents into three groups based on the positive affect they reported over a 24-hour period and then compared their mortality rates over a five-year period following the survey. Mortality rates among respondents in the highest positive affect group were reduced by 35% on average relative to those in the lowest positive affect group. This rate was robust even when controlling for demographic factors as well as health behaviors, self-reported health, and other conditions. Those in the high and medium positive affect groups had death rates of 3.6% and 4.6%, respectively, compared to 7.3% for the low positive affect group. Figure 4.1 below shows the differences in survival rates among the three groups in the follow-up period.

**Figure 4.1: Proportion of individuals surviving by level of positive affect in an analysis of the English Longitudinal Study of Ageing**



Notes: Figure from Steptoe and Wardle (2011). “Survival from affect assessment” is measured in months from initial interview where positive affect levels were reported. The English Longitudinal Survey of Ageing is a representative sample of older men and women living in England. Positive affect reported on a single day by individuals between 52 and 79 years old were used. Values are adjusted for age and sex. Respondents with the highest third of reported positive affect were 34% less likely to die over the period studied than those in the lowest positive affect group after controlling for demographic and health factors. Those in the high and medium positive affect groups had death rates of 3.6% and 4.6%, respectively, compared to 7.3% for the low positive affect group.

Primate studies also point to happiness affecting longevity. Weiss et al. (2011) found that orangutans who were rated as happier by their caretakers lived longer. Indeed, the difference between the apes that were one standard-deviation above versus below the mean in happiness was 11 years. Because these apes often live about 50 years in captivity, happiness accounted for a very large increase in longevity.

Research on the role of happiness in human evolution (a topic explored in more depth below) finds a relationship between well-being and successful reproduction. A recent review by Diener et al. (2012) highlighted the evidence linking positive mood to the frequency of sexual intercourse and fertility. For example, Rasmussen et al. (2009) found that pregnant women who were more optimistic tended to miscarry less frequently and have babies of a healthy weight.

The positive benefits of subjective well-being on health at the individual level generalize to more aggregate levels. Lawless and Lucas (2011) found that places with higher life satisfaction had greater life expectancies, with lower levels of mortality from heart disease, homicide, liver disease, diabetes, and cancer. Similarly, Blanchflower and Oswald (2008) found that higher levels of national well-being were related to lower levels of national hypertension in a sample of 16 nations. Blanchflower and Oswald (2008) also found that regions in the United Kingdom reporting more stress also had higher rates of blood pressure. Moum (1996) found that low subjective well-being is both a short- and long-term predictor of suicide, and uncovered similar findings in a 20-year study. Across 32 nations, it was found that experiencing higher life satisfaction and happiness was related to lower suicide rates.<sup>34</sup> These findings suggest that links between happiness and health outcomes are not simply relative in nature as they persist in aggregate and cross-national studies. Happiness can therefore influence health outcomes for both individual citizens and entire societies.

There is also evidence that negative affect can worsen health, even making illness more likely. For example, depressed people are substantially more likely to have cardiovascular problems, such as heart disease and strokes. Rugulies (2000) found in a review of 11 studies that depressed feelings predict coronary heart disease and that clinical levels of depression predict even more strongly. Similarly, when a person is angry and hostile they are more likely to suffer from coronary heart disease.<sup>35</sup> Depression is associated with unhealthy physiological processes, such as inflammation,<sup>36</sup> which is believed to be connected to the development of heart diseases. Antidepressant medications can lower inflammation. A review by Zorrilla et al. (2001) found that stress is related to a weaker immune system. Studies on fertility provide yet more evidence on how negative emotions can be detrimental to healthy functioning. Fertility is lower among depressed women.<sup>37</sup> An unhappy pregnancy is more likely to lead to a premature and low birth weight child.<sup>38</sup> However, as discussed above, the effect of negative affect is not a mirror image of that observed for positive affect. In a study of susceptibility to developing a cold, Cohen et al. (2003) found that individuals with positive emotional styles had greater resistance to the virus when controlling for other factors, whereas negative emotions were not associated with resistance. This suggests that positive and negative affect may impact on health through different pathways but further study is needed to understand this interaction.

### Happiness on income, productivity, and organizational behavior

The experience of happiness is beneficial to workplace success because it promotes workplace productivity, creativity, and cooperation. There are several reasons why this is the case. The experience of positive feelings motivates people to succeed at work and to persist with efforts to attain their goals. As discussed above, individuals who are happier are more likely to be healthy and will, in turn, tend to be more productive (in part, simply because happier and healthier individuals

will take fewer sick days). In addition, individuals who are happier better integrate information leading to new ideas, which leads to creativity and innovation. Finally, individuals who are happier tend to have better social relations. In the context of work this leads to greater cooperation among coworkers and with customers.

Oswald et al. (2012) investigated how positive feelings influence productivity in an experimental setting. In an experiment involving piece-rate pay for research participants across a number of days, the economists found that those who were put in a positive mood had a greater quantity of work output (about 10-12%), but no less quality of output. Those performing the task at low and medium levels of productivity were helped most by being put in a good mood. As part of that same research, Oswald et al. (2012) also found that a bad mood induced by family illness or bereavement had a detrimental impact on productivity.

Employees who are high in subjective well-being are more likely to achieve more while at work. Peterson et al. (2011) found that happy workers – optimistic and hopeful, resilient and high in self-efficacy – were more likely to be high in supervisor-rated performance and in financial performance. Conversely, whereas positive feelings reduce absenteeism from work, negative feelings increase absenteeism as well as turnover.<sup>39</sup>

Happiness has also been shown to enhance curiosity and creativity. Foremost, positive feelings are associated with curiosity and creativity.<sup>40</sup> Leitzel (2001) found that happy people are more likely to feel energetic and interested in doing things, as well as scoring higher on measures of curiosity. Further, there is a large experimental research literature showing that people put in a good mood tend to be more original, creative, and show greater cognitive flexibility.<sup>41</sup> Both Amabile et al. (2005) and George and Zhou (2007) found that workers are more creative when they experience positive moods. Indeed, two recent meta-analyses of experimental and non-experimental studies showed that although

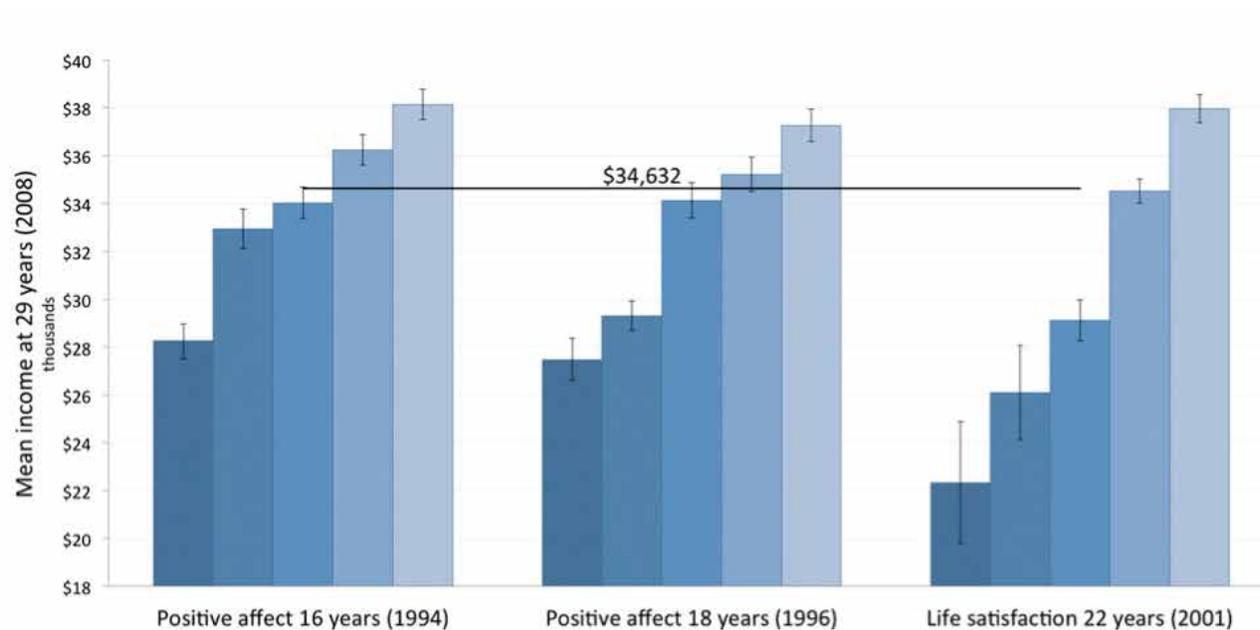
the strength of effects depend on the context and motivational focus, happiness is related to and generates creativity.<sup>42</sup>

A major reason for the success of happy individuals and organizations is that they experience on average more positive social relationships. Research clearly shows that happy workers are more cooperative and collaborative in negotiations than unhappy ones. In general, positive emotions boost cooperative and collaborative behavior in negotiations rather than withdrawal or competition.<sup>43</sup> Individuals who are in a positive mood are more willing to make concessions during negotiations.<sup>44</sup> Through cooperation, they reach a better joint solution in negotiations.<sup>45</sup> Individuals in a positive mood are more likely to make cooperative choices in a prisoner's dilemma game as well.<sup>46</sup> People in a positive mood are also more likely to show cohesion with their group. Recent experimental studies have shown that positive emotions lead to trust and cooperation when specific conditions are met.<sup>47</sup> Overall, happiness leads to cooperation and collaboration in the workplace, particularly so in situations involving negotiation.

On the other hand, negative emotions in the workplace, especially chronic or intense ones, can be very detrimental to the organization. For example, Felps et al. (2006) found that a single negative individual in a work unit often brings down the morale and functioning of the entire group.

One indicator of the subjective well-being of employees is job satisfaction.<sup>48</sup> A quantitative review found that job satisfaction is a key predictor of job performance, showing that happy employees are better performers in their workplace.<sup>49</sup> To establish a causal relation, a meta-analysis of panel data demonstrated that job satisfaction predicted future performance, but performance did not predict future job satisfaction.<sup>50</sup> Erdogan et al. (2012) reviewed the research showing that individuals with higher life satisfaction are more likely to have higher levels of career satisfaction, lower turnover intentions, and higher organizational commitment.

**Figure 4.2: Longitudinal relationship between subjective well-being during adolescence and young adulthood (ages 16, 18 and 22) and later earnings (at age 29)**



Notes: Figure from De Neve and Oswald (2012). The bars represent the response categories for positive affect (at ages 16 and 18) and life satisfaction (at age 22), from lowest to highest levels, and relate this to the mean income for the respondents in each category at age 29. Across the sample, the mean income at age 29 was \$34,632. Large samples were observed for each category (N=14,867 for positive affect at age 16, N=11,253 for positive affect at age 18 and N=12,415 for life satisfaction at age 22). A margin of error (i.e. 2 Standard Errors) is included around each estimate.

In line with the notion that happier workers are better workers, higher well-being is also shown to be associated with higher income<sup>51</sup> and future income.<sup>52</sup> De Neve and Oswald (2012) used a large US representative panel study to show that adolescents and young adults who report higher life satisfaction or positive affect grew up to earn significantly higher levels of income later in life. They used siblings as comparison controls, and also accounted for factors such as intelligence and health, as well as the human capacity to imagine later socioeconomic outcomes and anticipate the resulting feelings in current well-being (see Figure 4.2). Thus, to date, four longitudinal studies have systematically found that happiness at one point in time predicts higher future income, controlling for relevant factors such as intelligence, parental income, and even a sizable part of any genetic predispositions.<sup>53</sup>

Subjective well-being brings about greater success at the organizational level as well. Bockerman and Ilmakunnas (2012) found that job satisfaction predicts the productivity of manufacturing plants. Harter et al. (2010) found in a longitudinal study of 10 large organizations that worker engagement makes a difference to productivity. Work units in which employees were satisfied and otherwise felt highly engaged with their work led to improvements in the bottom line, measured in terms of revenue, sales, and profit.<sup>54</sup> On the other hand, reverse causality going from company success to employee satisfaction was weaker. An analysis of the “100 Best Companies to Work For in America” revealed that they increased more in equity value compared to the industry benchmarks. The resulting higher returns were about 3% per year.

The study by Harter and his colleagues (2010), based on 2,178 work units in 10 large companies, found that engaged and satisfied workers led to greater revenue, sales, and profits. The two factors that mediated the relation between employee engagement and the performance outcomes were customer loyalty and employee retention. It makes intuitive sense that customers would prefer to interact with positive employees and thus frequent the business. Employee retention is a large challenge for modern companies both because it is expensive to replace employees, especially highly skilled ones, and because more senior employees have more experience on the job. Thus, it is not surprising that employee engagement, resulting in customer loyalty and employee retention, accounted for 10% of the variability in the productivity of the corporations studied.

### Happiness on individual and social behavior

Subjective well-being has an impact on individual behavior and decision-making. Happiness and positive affect have been identified as determinants of economic behavior ranging from consumption and savings to time preferences and risk-taking. Research in psychology and economics suggests this may occur through improved integration of information and broadened focus of attention in happier individuals.<sup>55</sup> Thus, happier individuals may be better able to evaluate the implications of decisions with short and long term trade-offs, resulting in decisions that reflect greater self-control and appropriate risk-taking.

Well-being can influence how individuals evaluate outcomes that may occur in the present or future—a concept known in economics as time preference, or discounting. In survey and experimental evidence, Ifcher and Zarghamee (2011a) found that subjective well-being and positive affect were associated with less preference for consumption in the present relative to the future. Using a randomized assignment experiment, they observed that among the group where greater positive affect was induced, participants were less likely to discount future payments, i.e. they were

more likely to give up a smaller payment in the current period to receive a larger payment at a later point in time. This implies that individuals with greater positive affect may be more able to exercise self-control or delay gratification (i.e. foregoing smaller short term benefits in order to receive greater benefits in the future or to avoid longer term costs). Happy individuals are motivated to pursue long-term goals despite short-term costs.<sup>56</sup> Fry (1975) found that children placed in a happy mood better resisted temptation. Additionally, Lerner and Weber (2012) found in lab experiments that inducing sadness among participants led to a greater discounting of future rewards than those in a neutral state. Moreover, lack of self-control is also related to over-consumption, obesity, and financial decisions, suggesting that changes in well-being may influence their prevalence.<sup>57</sup>

Greater self-control and longer-term time preferences among happier people have been linked to consumption and saving behaviors. Guven (2012) analyzed two representative longitudinal household surveys in the Netherlands and Germany to estimate the causal relationship (if any) between happiness and consumption and saving behaviors. The regression results found that happier people were more likely to save more and consume less than others. Further, happier people had different expectations about the future than those less happy. These individuals were more optimistic about the future, took more time when making decisions, and had higher perceived life expectancies (i.e. moving from “neither happy or unhappy” to “happy” was associated with 1.1 year increase in perceived life expectancy).<sup>58</sup> Thus, happier individuals may be more forward-thinking and willing to consider the long-term implications of decisions taken in the present, leading to “better” decisions for themselves and society.

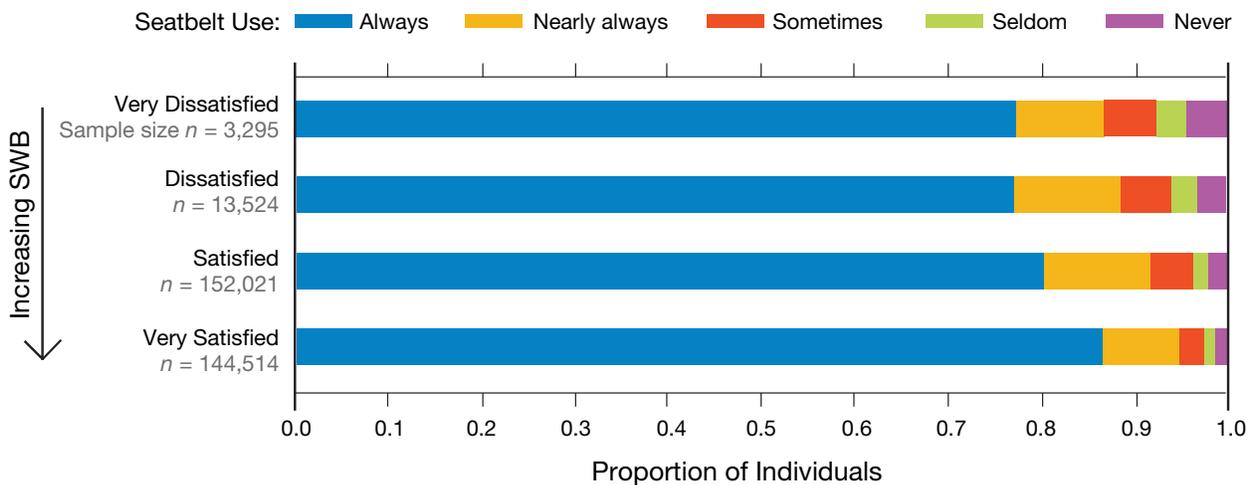
The probability of being re-employed has also been linked to individual happiness. Among individuals recently entering unemployment in Germany,

Krause (2012) found a statistically significant positive relationship between job seekers with higher than average well-being and the probability of re-employment within a year. Additionally, these individuals were more likely to enter into self-employment, suggesting a link between happiness and entrepreneurship. Interestingly, the effect of happiness on re-employment decreased at the extremes, indicating that an “optimal” level of happiness may exist.

Research on individual risk-taking provides evidence of a relationship between happiness and risk-related behavior. According to economic theory, happier individuals have more to lose from engaging in risky behavior that may carry the risk of injury or death. Happier individuals should therefore be more willing to engage in activities that reduce risk. Goudie et al. (forthcoming) found that seatbelt use and not being

involved in a motor vehicle accident were both more likely among those with higher subjective well-being (see Figure 4.3 with respect to seatbelt use). In a representative sample of 313,354 US households, the authors estimated that individuals who reported being “very satisfied” with life were 5.3% more likely to always wear a seatbelt in the survey, even after controlling for potentially confounding factors. When Goudie et al. (forthcoming) looked at the probability of motor vehicle accidents, they found that individuals with higher levels of life satisfaction were less likely to be involved in an accident several years later.<sup>59</sup> While these statistical analyses cannot fully rule out the possibility of reverse causality, the results are robust to including a number of confounding variables and provide strong evidence for a positive relationship between happiness and risk-avoiding behavior.

**Figure 4.3: Frequency of seatbelt use by subjective well-being in a US representative sample**



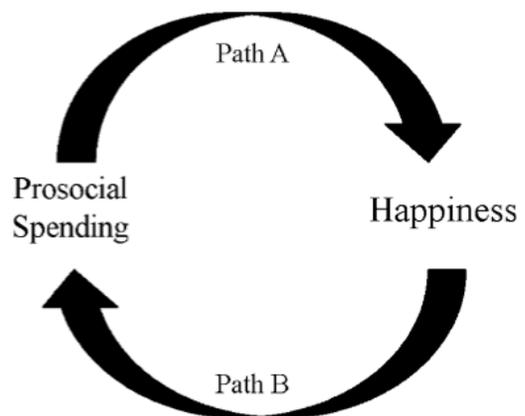
Notes: Figure from Goudie et al. (forthcoming). Data is from the Behavioral Risk Factor Surveillance System, a random-digit telephone survey in the US, N=313,354. Pearson’s chi-squared statistic = 3,242, p-value < 2.2 x 10<sup>-16</sup>. Cross-tabulation figures indicate that subjective well-being and seatbelt use are strongly correlated but this does not account for other factors that may explain this relationship. Goudie et al. (forthcoming) use regression analysis to control for other potentially confounding factors and find the association is robust to these controls. Individuals who report they are “very satisfied” with life are 5.3% more likely to state they always wear a seatbelt. The authors also find that subjective well-being at the time of the survey is statistically significantly associated with a lower probability of having a motor vehicle accident several years later (even after controlling for confounding factors).

Research studies also indicate a powerful link between high subjective well-being and social behavior, such as being a better friend, colleague, neighbor, and citizen. People who are in a positive mood see others more inclusively and sympathetically. For example, they are less biased against other ethnic groups.<sup>60</sup> Nelson (2009) found that people in a positive mood induction condition, as compared to neutral and negative mood conditions, showed greater compassion, perspective taking, and sympathy for a person experiencing distress.

Individuals who report high subjective well-being give more to their communities — in both time and money. Morrison et al. (2012) found that both life satisfaction and positive feelings predicted reports of donating money to charity, helping a stranger, and volunteering activities. Oishi et al. (2007) found that happier people volunteer more. Aknin et al. (2013) found in a study of 136 countries that prosocial uses of money by happy people generalized across regions of the world. However, further research is underway to clarify the causal relationship between prosocial spending and happiness. Priller and Shupp (2011) found slightly higher rates of blood donation, as well as monetary giving to charity, among happier individuals. They also found that those who were satisfied with their incomes were more likely to donate money to worthy causes.

Do happy moods *cause* the helping behavior and good citizenship? It is a consistent finding in social psychology experiments that when people are induced into a good mood, by various means, they are more likely to help others.<sup>61</sup> These experimental studies in which people who are put into a good mood and compared to those in a neutral mood leave little doubt that happier feelings generally tend to increase helping. The fact that people give both more time and money when they are put into a positive mood in an experiment indicates that being happy raises prosocial behavior.<sup>62</sup> Aknin et al. (2012) suggest that the relation between mood and helping is circular as shown in Figure 4.4. When people are in a good

**Figure 4.4: Model of positive feedback loop between prosocial spending and happiness**



Notes: Figure from Aknin, Dunn and Norton (2012). The model posits that prosocial spending promotes happiness and, in turn, happiness improves the probability of future prosocial spending.

mood they tend to help others; helping others in turn fosters a good mood. Thus, friends, family, neighbors, and the society as a whole tend to profit from happy people because these individuals are more likely to be helpful to others.

Having supportive relationships boosts subjective well-being, but having high subjective well-being in turn leads to better social relationships.<sup>63</sup> Thus, good relationships both cause happiness and are caused by it. Two major reasons why happiness benefits social relationships are because happiness increases a person's level of sociability and also improves the quality of social interactions. Happier people have a larger quantity and better quality of friendships and family relationships.<sup>64</sup>

Frequent positive emotions create a tendency in people to be more sociable. In a laboratory experiment people placed in a positive mood expressed greater interest in social and prosocial activities compared to those in a neutral condition, whereas those placed in a negative mood indicated lower interest in social activities.<sup>65</sup> This pattern was replicated in a second study that found an interest in social and prosocial activities among those in

a good mood. People who were placed in a good mood expected social activities to be more rewarding than those not placed in a good mood. Similarly, other experimental studies have demonstrated that inducing happiness, in contrast to sadness, makes people more likely to express liking for others they meet for the first time.<sup>66</sup> On the other hand, the absence of positive feelings is accompanied by feeling bored, unsociable, uninterested in things, slowed down, and unenergetic, reflecting a lack of active involvement with the environment and other people.<sup>67</sup> It has also been shown that depressed individuals cause others to react in a negative manner.<sup>68</sup> This can lead to unwillingness to have future interactions with those who have low happiness.

The links between positive moods and sociability are not just in terms of *feeling* sociable, but translate into actual behavior. Cunningham (1988a) discovered that people in an induced positive mood condition compared to a negative mood condition were more talkative. Mehl et al. (2010) monitored people's everyday conversations for four days and assessed happiness through both self-reports and informant reports. They found that happy participants spent about 25% less time alone and about 70% more time talking when they were with others. Furthermore, the happy participants engaged in less small talk and more substantive conversations compared to their unhappy peers.

Recent evidence shows the happiness-relationship link occurs across cultures. Lucas et al. (2000) found that across the world positive feelings were associated with tendencies for affiliation, dominance, venturesomeness, and social interaction. Similarly, a world survey of 123 nations found that the experience of positive feelings was strongly related to good social relationships across different socio-cultural regions.<sup>69</sup>

Happy people are not just more sociable; they also experience higher-quality social relationships. Kazdin et al. (1982) found that children put in a positive mood showed greater social skills and confidence in social behavior than those not put

in a good mood. Boehm and Lyubomirsky (2008) reviewed evidence showing that happy people tend to be more popular and likable. One study showed that reports of better interaction quality were not merely a function of the happy person's perceptions, but that observers similarly rated happier individuals as having better interactions with strangers.<sup>70</sup>

Happiness has the potential to generate positive snowball effects in society. Research has shown that people who are happier are likely to bring happiness to those around them, resulting in networks of happier individuals. It was found that happiness extends up to three degrees of separation, and longitudinal models show that individuals who are surrounded by happy people are likely to become happier in the future.<sup>71</sup>

Happiness can also have effects on the long-term quality of relationships. Luhmann et al. (2013) found that unmarried people high in life satisfaction are more likely to get married in the following years and less likely to get separated or divorced if they get married. Conversely, Stutzer and Frey (2006) found low life satisfaction prior to courtship predicted later dissolution of the marriage.

Depression, which is characterized by low or absent positive feelings, creates problems in social relationships such as divorce, limited social support, and distancing from one's neighbors.<sup>72</sup> Even minor depression results in problems in social relations, such as higher rates of divorce.<sup>73</sup> Even those recovering from depression show impairments in the social and occupational domains.<sup>74</sup> In addition, clinical depression interferes with executive functioning, which is a hallmark of humans' special adaptive abilities. For example, Fossati et al. (2002) review evidence indicating that depressed individuals suffer deficits in problem solving and planning. Snyder (2012) reviewed extensive evidence showing that depressed people suffer substantially from broad impairments in executive functions, such as planning, with strong effect sizes varying from 0.32 to 0.97.

In sum, there is substantial evidence connecting positive moods to higher sociability and better quality of social relationships, and the opposite is the case for negative moods and depression. Happier people enjoy the company of others, and find that interacting with people is more rewarding compared to less happy individuals. Others in turn enjoy interacting with happy individuals. Those high in subjective well-being thus have more rewarding and stable social relationships.

### Moderation, mediation, and the evolutionary role of happiness

Although happy people and societies have a number of advantages, this does not imply that high subjective well-being is a panacea for everything. To illustrate, happiness can facilitate good health but is not a guarantee of it. Happy individuals may die at a young age. However, on average they will live longer. We can make statements about the effects of average happiness using the notion of *ceteris paribus* (i.e. assuming “all other things being equal”) because in particular cases there will be other factors that override the influence of high subjective well-being.

Not every study has found positive benefits for long-term happiness. A few studies find no differences between happier and less happy individuals, and the rare study has shown opposite effects. This is common in research because of sampling, methodology, and other differences between studies. Nonetheless, reviews that summarize results across studies have virtually always shown benefits for high subjective well-being. One reason for the few null findings is that happiness will not show its value in all samples and contexts. For instance, for young adults there might be no differences in health or longevity due to happiness because young adults very rarely die and mostly have healthy bodies. The results of happiness and unhappiness become more manifest as adults age. Similarly,

one would not be surprised if happiness did not reduce divorce in a nation where divorce is virtually nonexistent.

Another caution about the conclusion that happiness is desirable is that people do not need to be constantly euphoric or ecstatic. Happy people most of the time feel merely pleasant — a mild positive state. Only occasionally do happy people feel intensely positive. Oishi et al. (2007) found that although the happiest individuals did very well in social relationships, the moderately happy — not 100% satisfied — often did the best in achievement domains. There is evidence that frequent high-arousal emotions could be harmful to health.<sup>75</sup> Krause (2012) shows that re-employment prospects actually decreased for those with extreme levels of happiness. Furthermore, in a randomized lab experiment, Ifcher and Zarghamee (2011b) found that positive affect increased overconfidence among participants in the treatment group. Thus, extremely high happiness is not a recipe for extremely effective functioning, and in fact, moderate happiness can be more helpful.

It is important to note that happy people also occasionally feel unhappy, and this is not necessarily undesirable. Gruber et al. (2011) and Forgas (2007), as well as others, have shown that in some situations negative emotions can help people to respond more effectively. Thus, happiness does not mean a complete absence of negative feelings. The happy person, however, does not feel chronic negative feelings; he or she experiences negative feelings only occasionally, not frequently, and in appropriate situations.

An important question that is receiving increasing attention is *how* well-being and positive emotions may influence life outcomes. This is an emerging area of research with important contributions from psychology and neuroscience. The pathways leading from happiness to the life outcomes discussed in this chapter can either be direct or be subject to moderation and/or mediation by other variables that influence the

effect that subjective well-being may have on a trait or outcome of interest. Our discussion here is mostly on mediating pathways that may carry some part of the influence of happiness onto the outcome of interest and thus help explain the relationship. One branch of thinking in psychology posits that positive emotions broaden cognitive capacity and attention, allowing individuals to engage in the behaviors and build the skills associated with better health, productivity, and social interaction.<sup>76</sup> Evidence from lab experiments provides initial backing for this theory. For example, Fredrickson and Branigan (2005) found that participants where positive emotions were induced showed greater scope of cognition and attention in psychological tests.

Studies focusing on neurological processes also support this approach and provide evidence for a connection between well-being and brain structure. Experiments using brain imaging to monitor participants' neurological processes have reported that positive affect is associated with activity in a part of the brain that is associated with "exploratory modes of thought and behavior."<sup>77</sup> Further, Schmitz et al. (2009) found that affect can also alter neurological processing of visual stimuli — specifically, positive affect led to a widening of individuals' field of vision. Small-scale trials of the effect of mindfulness training, a type of meditation that has been linked to improved well-being in psychological studies, have also been shown to increase grey matter in parts of the brain that are believed to regulate cognition and emotion.<sup>78</sup> Happiness may therefore be linked to neurological and cognitive processes that influence human behavior and particularly to behaviors that require broader and more integrative thinking (e.g. considering benefits over a longer time period or helping others).

In a promising new development in the study of mediating pathways between subjective well-being and health outcomes, Fredrickson and colleagues (2013) provide preliminary evidence for different epigenetic dynamics as a result of varying levels and types of happiness. The authors find that varied states of well-being influence gene expression

with particular relevance to genotypes underlying the immune system. Although the study is small-scale and is mostly interested in the epigenetic effects of different types of well-being (hedonic and eudaimonic well-being) it opens a promising new direction in the study of how happiness may influence health outcomes.

In their study of happiness in young adulthood and earnings later in life, De Neve and Oswald (2012) shed light on the potential pathways between happiness and income in a longitudinal survey. Their mediation tests reveal a direct effect as well as indirect effects that carry the influence from happiness to income. Significant mediating pathways include obtaining a college degree and a job, higher degrees of optimism and extraversion, and less neuroticism.<sup>79</sup>

Given the increasing evidence for a strong connection between happiness and behavior, a handful of studies have started to investigate the role of well-being in human evolution. Happiness is argued to play a role in promoting evolutionary success in two possible ways: (1) the experience of happiness acts as a reward for behaviors that increase the likelihood of evolutionary success (e.g. survival, reproduction, resource accumulation, etc.); or, alternatively, (2) given that happiness is beneficial to survival and other important life outcomes (such as those discussed throughout this chapter), it has persisted as an evolutionary characteristic.

Happiness as a reward mechanism for evolutionarily-advantageous behaviors has been explored in psychological and neurological research. A review of laboratory experiments by Wise (2004) highlighted the critical role dopamine plays in the neurological learning processes that embed how the brain anticipates reward and prompts action to obtain this reward. For example, Wise (2004) discusses a study where mice whose dopamine production is impaired are less able to undertake previously learned tasks to receive a reward (e.g. pressing a certain lever to receive food). Psycholo-

gists have argued elsewhere that positive affect and dopamine levels are connected.<sup>80</sup> They hypothesize that the positive affect feedback from goal-directed behavior and the associated dopamine production are crucial to understanding how humans “learn” what behaviors and habits promote evolutionary success. This fits with other evolutionary theories that suggest the pursuit and experience of happiness incentivizes and increases the probability of successfully engaging in behaviors that improve health, productivity, and reproduction.<sup>81</sup>

Diener et al. (forthcoming) find that in a globally representative sample, 70% of respondents reported enjoying much of the previous day.<sup>82</sup> The fact that happiness is a relatively common human trait can be considered indicative of its important role in evolutionary fitness. The authors also review the evidence that “positive mood offset,” or the presence of positive mood in a neutral state, is associated with characteristics, such as longevity, material and social resource accumulation, and fertility, that have allowed humans to propagate successfully.

## Conclusion

Existing scientific evidence indicates that subjective well-being has an objective impact across a broad range of behavioral traits and life outcomes, and does not simply follow from them. In fact, we observe the existence of a *dynamic* relationship between happiness and other important aspects of our lives with effects running in both directions. Experimental research in which moods and emotions are induced in some participants and their actions are compared to a control group show that positive moods lead to creativity, sociability, altruism, and beneficial physiological patterns. Levels of subjective well-being are found to predict future health, mortality, productivity, and income, controlling statistically for other possible determinants. For example, young people who are less happy many years before they meet their future spouse later show higher rates of divorce compared to their happier peers. Furthermore, predictions in the other direction, from condi-

tions to subjective well-being (that is, conditions influencing happiness) are also positive, helping to create feedback loops that may raise the longer-term happiness effects.

Although high subjective well-being tends to help people function better, it is of course not magic or a cure-all. Happy people do get sick and do lose friends. Not all happy people are productive workers. Happiness is like any other factor that aids health and functioning—all other things being equal it is likely (but not guaranteed) to help. Needless to say that many other factors such as personality, intelligence, and social capital are also important for good functioning.

It is important to emphasize that research does not prescribe extreme bliss but, rather, tentative evidence suggests that a moderate degree of happiness tends to be “optimal” for the effects surveyed in this chapter. Thus, a desirable level of happiness would imply feeling mildly to moderately positive most of the time, with occasional negative emotions in appropriate situations.

There is initial evidence about the processes that mediate between happiness and beneficial outcomes. For instance, happiness is associated with greater cooperation, motivation, and creativity, which in turn are instrumental to success in business, and in life as a whole. Conversely, depression creates problems, such as illness and quitting one’s job more frequently, that all lead to less success in the workplace. Similarly, positive feelings harness the immune system and lead to fewer cardiovascular problems, whereas anxiety and depression are linked to poorer health behaviors and problematical physiological indicators, such as inflammation. Thus, a causal mechanism of happiness on health and longevity can be understood with the mediating mechanisms that are now being uncovered. Research in the field of neuroscience provides further prospects for new scientific insights on mediating pathways between happiness to behavioral traits and socio-economic outcomes of interest.

It naturally follows from this survey that it is important to balance economic measures of societal progress with measures of subjective well-being, to ensure that economic progress leads to broad improvements across life domains, not just greater economic capacity. By assessing subjective well-being as well as economic variables, a society can gauge whether overall net progress is positive in terms of raising human well-being. Diener et al. (2009) detail the case for national accounts of well-being. Most arguments for putting happiness more center-stage in policy making have been normative in nature; happiness is what would appear to matter most to most people. The aim of this chapter is to complement and inform the normative reasoning with a survey of the “hard”

evidence on the benefits of subjective well-being across outcomes of importance, such as health, income, and social behavior. A better understanding of the objective benefits of raising happiness may help in estimating the potential impact of making happiness more central in policy making and in enhancing policy evaluation by informing cost-benefit analyses. Indeed, an argument could be constructed that raising subjective well-being leads to positive externalities or spillover effects across a number of policy domains, ranging from health to traffic safety. Given the tangible benefits to individuals and societies of moderately high well-being, it is imperative that we act to effectively put well-being at the heart of policy and generate the conditions that allow everyone to flourish.

- 
- 1 Appleton et al. (2011); Slopen et al. (2012).
  - 2 Edwards & Cooper (1988); Kiecolt-Glaser, McGuire, Robles, & Glaser (2002); Cohen, Doyle, Turner, Alper, & Skoner (2003).
  - 3 Bhattacharyya, Whitehead, Rakhit, & Steptoe (2008).
  - 4 Ong (2010); Steptoe, Wardle, & Marmot (2005); Steptoe, Dockray, & Wardle (2009).
  - 5 Ostir, Markides, Peek, & Goodwin (2001); Davidson, Mostofsky, & Whang (2010); Cohen et al. (2003).
  - 6 Blanchflower, Oswald, & Stewart-Brown (2012); Steptoe (1982); Pettay (2008); Schneider, Graham, Grant, King, & Cooper (2009); Garg, Wansink, & Inman (2007); Strine et al. (2008a, 2008b); Grant, Wardle, & Steptoe (2009); Kubzansky, Gilthorpe, & Goodman (2012).
  - 7 Fredrickson (2001); Fredrickson & Levenson (1998); Fredrickson, Mancuso, Branigan, & Tugade (2000).
  - 8 Danner, Snowdon, & Friesen (2001); Pressman & Cohen (2012); Wiest, Schuz, Webster, & Wurm (2011); Russ et al. (2012); Bush et al. (2001); Chida & Steptoe (2008); Epel et al. (2004); Steptoe & Wardle (2011).
  - 9 Oswald, Proto, & Sgroi (2012).
  - 10 Peterson, Luthans, Avolio, Walumbwa, & Zhang (2011).
  - 11 Ashby, Valentin, & Turken (2002); Jovanovic & Brdaric (2012); Leitzel (2001); Isen, Daubman, & Nowicki (1987); Amabile, Barsade, Mueller, & Staw (2005); George & Zhou (2007); Baas, De Dreu, & Nijstad (2008); Davis (2009).
  - 12 Baron, Fortin, Frei, Hauver, & Shack (1990); Barsade (2002); Carnevale (2008); Forgas (1998); Baron (1990); Baron, Rea, & Daniels (1992); Carnevale & Isen (1986); Lawler, Thye, & Yoon (2000); Hertel, Neuhof, Theuer, & Kerr (2000); Lount (2010).
  - 13 Judge, Piccolo, Podsakoff, Shaw, & Rich (2010); Diener, Nickerson, Lucas, & Sandvik (2002); Graham, Eggers, & Sandip (2004); Marks & Fleming (1999).
  - 14 De Neve & Oswald (2012).
  - 15 Bockerman & Ilmakunnas (2012); Harter, Schmidt, Asplund, Killham, & Agrawal (2010); Edmans (2011, 2012).
  - 16 Ifcher & Zarghamee (2011a).
  - 17 Aspinwall (1998); Fry (1975).
  - 18 Guven (2009).
  - 19 Krause (2012).
  - 20 Goudie, Mukherjee, De Neve, Oswald, & Wu (forthcoming).
  - 21 Morrison, Tay, & Diener (2012); Oishi, Diener, & Lucas (2007); Aknin et al. (2013).
  - 22 Lyubomirsky, King, & Diener (2005); Myers (2000); Diener & Seligman (2002); Cunningham (1988b); Baron (1987, 1990); Berry & Hansen (1996).
  - 23 Cunningham (1988b); Mehl, Vazire, Holleran, & Clark (2010).
  - 24 Lucas, Diener, Grob, Suh, & Shao (2000); Tay & Diener (2011); Fowler & Christakis (2008).

- 25 Chida & Steptoe (2008); Cohen & Pressman (2006); Diener & Chan (2011); Howell, Kern, & Lyubomirsky (2007); Lyubomirsky et al. (2005); Pressman & Cohen (2005).
- 26 Appleton et al. (2011); Slopen et al. (2012).
- 27 Edwards & Cooper (1988); Kiecolt-Glaser et al. (2002).
- 28 Ostir et al. (2001).
- 29 Christian, Graham, Padgett, Glaser, & Kiecolt-Glaser (2006).
- 30 Tay & Diener (2011).
- 31 Cacioppo & Patrick (2008).
- 32 Boehm & Kubzansky (2012); Boehm, Peterson, Kivimaki, & Kubzansky (2011).
- 33 Fredrickson et al. (2000); Fredrickson (1998).
- 34 Bray & Gunnell (2006).
- 35 Smith, Glazer, Ruiz, & Gallo (2004).
- 36 Dinan (2009).
- 37 Gotz, Martin, & Volker (2008); Neggers, Goldenberg, Cliver, & Hauth (2006); Wisner et al. (2009).
- 38 Field, Diego, & Hernandez-Reif (2006); Field et al. (2009); Orr & Miller (1995); Williamson et al. (2008).
- 39 Pelled & Xin (1999).
- 40 Ashby et al. (2002); Jovanovic & Brdaric (2012).
- 41 Isen et al. (1987).
- 42 Baas et al. (2008); Davis (2009).
- 43 Baron et al. (1990); Barsade (2002); Carnevale (2008); Forgas (1998).
- 44 Baron et al. (1990); Baron, Rea, & Daniels (1992).
- 45 Carnevale & Isen (1986).
- 46 Lawler, Thye, & Yoon, (2000).
- 47 Hertel et al. (2000); Lount (2010).
- 48 Judge & Kingler (2007).
- 49 Judge, Thoreson, Bono, & Patton (2001).
- 50 Riketta (2008).
- 51 Judge et al. (2010).
- 52 Diener, Nickerson, Lucas, & Sandvik (2002); Graham, Eggers, & Sandip (2004); Marks & Fleming (1999).
- 53 De Neve (2011); De Neve, Christakis, Fowler, & Frey (2012); Rietveld et al. (2013).
- 54 Similarly, Edmans (2011, 2012) found evidence consistent with the importance of employee satisfaction for firm performance.
- 55 Fredrickson & Branigan (2005); Estrada, Isen, & Young (1997); Isen, Rosenzweig, & Young (1991).
- 56 Aspinwall (1998).
- 57 Guven (2012).
- 58 Ibid.
- 59 Goudie et al. (forthcoming) estimate that the probability of being involved in an accident is reduced by a factor of about 0.9.
- 60 Johnson & Fredrickson (2005).
- 61 Carlson, Charlin, & Miller (1988).
- 62 Anik, Aknin, Norton, & Dunn (2009).
- 63 Lyubomirsky et al. (2005); Myers (2000).
- 64 Diener & Seligman (2002).
- 65 Cunningham (1988b).
- 66 Baron (1987); Baron (1990).
- 67 Watson et al. (1995).
- 68 Coyne (1976).
- 69 Tay & Diener (2011).
- 70 Berry & Hansen (1996).
- 71 Fowler & Christakis (2008).
- 72 Gotlib & Hammen (2009).
- 73 Beck & Koenig (1996).
- 74 Romera et al. (2010).
- 75 Pressman & Cohen (2005).
- 76 Fredrickson (1998, 2001); Fredrickson & Branigan (2005); Kok et al. (2013).
- 77 Schmitz, De Rosa, & Anderson (2009).
- 78 Hölzela et al. (2011).
- 79 De Neve & Oswald (2012).
- 80 Ashby, Isen, & Turken (1999).
- 81 Lyubomirsky & Boehm (2010); Graham & Oswald (2010).
- 82 The Gallup World Poll is a representative sample of 941,161 individuals from 160 nations.

## Bibliography

- Aknin, L. B., Barrington-Leigh, C. P., Dunn, E. W., Helliwell, J. F., Biswas-Diener, R., Kemeza, I., Nyende, P., Ashton-James, C. E., & Norton, M. I. (2013). Prosocial spending and well-being: Cross-cultural evidence for a psychological universal. *Journal of Personality and Social Psychology, 104*, 635-652.
- Aknin, L. B., Dunn, E. W., & Norton, M. I. (2012). Happiness runs in a circular motion: Evidence for a positive feedback loop between prosocial spending and happiness. *Journal of Happiness Studies, 13*, 347-355.
- Amabile, T. M., Barsade, S. G., Mueller, J. S., & Staw, B. (2005). Affect and creativity at work. *Administrative Science Quarterly, 50*, 367-403.
- Anik, L., Aknin, L. B., Norton, M. I., & Dunn, E. W. (2009). Feeling good about giving: The benefits (and costs) of self-interested charitable behavior. Harvard Business School Marketing Unit Working Paper No. 10-012. Available at SSRN: <http://ssrn.com/abstract=1444831> or <http://dx.doi.org/10.2139/ssrn.1444831>
- Appleton, A. A. Buka, S. L., McCormick, M. C., Koenen, K. C., Loucks, E. B., Gilman, S. E., & Kubzansky, L. D. (2011). Emotional functioning at age 7 years is associated with C-reactive protein in middle adulthood. *Psychosomatic Medicine, 73*, 295-303.
- Ashby, F. G., Isen, A. M., & Turken, A. U. (1999). A neuropsychological theory of positive affect and its influence on cognition. *Psychological Review, 106*, 529-550.
- Ashby, F. G., Valentin, V. V., & Turken, U. (2002). The effects of positive affect and arousal on working memory and executive attention. In S. Moore & M. Oaksford (Eds.), *Emotional cognition: From brain to behaviour* (pp. 245-287). Amsterdam: John Benjamins.
- Ashton, H., & Stepney, R. (1982). *Smoking: Psychology and pharmacology*. London: Tavistock Publications.
- Aspinwall, L. G. (1998). Rethinking the role of positive affect in self-regulation. *Motivation and Emotion, 22*, 1-32.
- Baas, M., De Dreu, C. K. W., & Nijstad, B. A. (2008). A meta-analysis of 25 years of mood-creativity research: Hedonic tone, activation, or regulatory focus? *Psychological Bulletin, 134*, 779-806.
- Baron, R. A. (1987). Interviewer's moods and reactions to job applicants: The influence of affective states on applied social judgments. *Journal of Applied Social Psychology, 17*, 911-926.
- Baron, R. A. (1990). Environmentally induced positive affect: Its impact on self-efficacy, task performance, negotiation, and conflict. *Journal of Applied Social Psychology, 20*, 368-384.
- Baron, R. A., Fortin, S. P., Frei, R. L., Hauver, L. A., & Shack, M. L. (1990). Reducing organizational conflict: The role of socially-induced positive affect. *The International Journal of Conflict Management, 1*, 133-152.
- Baron, R. A., Rea, M. S., & Daniels, S. G. (1992). Effects of indoor lighting (illuminance and spectral distribution) on the performance of cognitive tasks and interpersonal behaviors: The potential mediating role of positive affect. *Motivation and Emotion, 16*, 1-33.
- Barsade, S. (2002). The ripple effect: Emotional contagion and its influence on group behavior. *Administrative Science Quarterly, 47*, 644-675.
- Beck, D. A., & Koenig, H. G. (1996). Minor depression: A review of the literature. *International Journal of Psychiatry in Medicine, 26*, 177-209.
- Berry, D. S., & Hansen, J. S. (1996). Positive affect, negative affect, and social interaction. *Journal of Personality and Social Psychology, 71*, 796-809.
- Bhattacharyya, M. R., Whitehead, D. L., Rakhit, R., & Steptoe, A. (2008). Depressed mood, positive affect, and heart rate variability in patients with suspected coronary artery disease. *Psychosomatic Medicine, 70*, 1020-1027.
- Blanchflower, D. G., & Oswald, A. J. (2008). Hypertension and happiness across nations. *Journal of Health Economics, 27*, 218-233.
- Blanchflower, D. G., Oswald, A. J., & Stewart-Brown, S. (2012). Is psychological well-being linked to the consumption of fruit and vegetables? *Social Indicators Research*, in press.
- Bockerman, P., & Ilmakunnas, P. (2012). The job-satisfaction-productivity nexus: A study using matched survey and register data. *Industrial & Labor Relations Review, 65*, 244-262.
- Boehm, J. K., & Kubzansky, L. D. (2012). The heart's content: The association between positive psychological well-being and cardiovascular health. *Psychological Bulletin, 138*, 655-691.
- Boehm, J. K., Peterson, C., Kivimaki, M., & Kubzansky, L. (2011). A prospective study of positive psychological well-being and coronary heart disease. *Health Psychology, 30*, 259-267.

- Boehm, J. K., & Lyubomirsky, S. (2008). Does happiness lead to career success? *Journal of Career Assessment*, 16, 101-116.
- Bray, I., & Gunnell, D. (2006). Suicide rates, life satisfaction and happiness as markers for population mental health. *Social Psychiatry and Psychiatric Epidemiology*, 41, 333-337.
- Bush, D. E., Ziegelstein, R. C., Tayvack, M., Richter, D., Zahalsky, H., & Fauerbach, J. A. (2001). Even minimal symptoms of depression increase mortality risk after acute myocardial infarction. *American Journal of Psychiatry*, 15, 337-341.
- Cacioppo, J. T., & Patrick, W. (2008). *Loneliness: Human nature and the need for social connection*. New York: W. W. Norton.
- Carlson, M., Charlin, V., & Miller, N. (1988). Positive mood and helping behavior: A test of six hypotheses. *Journal of Personality and Social Psychology*, 55, 211-229.
- Carnevale, P. J. (2008). Positive effect and decision frame in negotiation. *Group Decision and Negotiation*, 17, 51-63.
- Carnevale, P. J. D., & Isen, A.M. (1986). The influence of positive affect and visual access on the discovery of integrative solutions in bilateral negotiations. *Organizational Behavior and Human Decision Processes*, 37, 1-13.
- Chida, Y., & Steptoe, A. (2008). Positive psychological well-being and mortality: A quantitative review of prospective observational studies. *Psychosomatic Medicine*, 70, 741-756.
- Christian, L. M., Graham, J. E., Padgett, D. A., Glaser, R., & Kiecolt-Glaser, J. K. (2006). Stress and wound healing. *Neuro-immunomodulation*, 13, 337-346.
- Cohen, S., Doyle, W. J., Turner, R. B., Alper, C. M., & Skoner, D. P. (2003). Emotional style and susceptibility to the common cold. *Psychosomatic Medicine*, 65, 652-657.
- Cohen, S., & Pressman, S. D. (2006). Positive affect and health. *Current Directions in Psychological Science*, 15, 122-125.
- Coyne, J. C. (1976). Depression and the response of others. *Journal of Abnormal Psychology*, 85, 186-193.
- Cunningham, M. R. (1988a). Does happiness mean friendliness? Induced mood and heterosexual self-disclosure. *Personality and Social Psychology Bulletin*, 14, 283-297.
- Cunningham, M. R. (1988b). What do you do when you're happy or blue? Mood, expectancies, and behavioral interest. *Motivation and Emotion*, 12, 309-330.
- Danner, D. D., Snowdon, D. A., & Friesen, W. V. (2001). Positive emotions in early life and longevity: Findings from the nun study. *Journal of Personality and Social Psychology*, 80, 804-813.
- Davidson, K. W., Mostofsky, E., & Whang, W. (2010). Don't worry, be happy: Positive affect and reduced 10-year incident coronary heart disease: The Canadian Nova Scotia health survey. *European Heart Journal*, 31, 1065-1070.
- Davis, M. A. (2009). Understanding the relationship between mood and creativity: A meta-analysis. *Organizational Behavior and Human Performance*, 108, 25-38.
- De Neve, J.-E., & Oswald, A. J. (2012). Estimating the influence of life satisfaction and positive affect on later income using sibling fixed effects. *PNAS: Proceedings of the National Academy of Sciences*, 109(49), 19953-19958.
- De Neve, J.-E. (2011). Functional polymorphism (5-HTTLPR) in the serotonin transporter gene is associated with subjective well-being: Evidence from a U.S. nationally representative sample. *Journal of Human Genetics*, 56, 456-459.
- De Neve, J.-E., Christakis, N. A., Fowler, J. H., & Frey, B. S. (2012). Genes, economics, and happiness. *Journal of Neuroscience, Psychology, and Economics*, 5(4), 193-211.
- Diener, E., & Chan, M. (2011). Happy people live longer: Subjective well-being contributes to health and longevity. *Applied Psychology: Health and Well-being*, 3, 1-43.
- Diener, E., & Diener, C. (1996). Most people are happy. *Psychological Science*, 7, 181-185.
- Diener, E., Lucas, R., Schimmack, U., & Helliwell, J. (2009). *Well-being for public policy*. New York: Oxford University Press.
- Diener, E., Nickerson, C., Lucas, R. E., & Sandvik, E. (2002). Dispositional affect and job outcomes. *Social Indicators... Research*, 59, 229-259.
- Diener, E., Oishi, S., & Suh, E. (2012). Positive emotion offset was essential to human evolutionary success. Paper submitted for publication, University of Illinois.

- Diener, E., & Seligman, M. E. P. (2002). Very happy people. *Psychological Science*, 13, 81-84.
- Dinan, T. G. (2009). Inflammatory markers in depression. *Current Opinion in Psychiatry*, 22, 32-36.
- Edmans, A. (2011). Does the stock market fully value intangibles? Employee satisfaction and equity prices. *Journal of Financial Economics*, 101, 621-640.
- Edmans, A. (2012). The link between job satisfaction and firm value, with implications for corporate social responsibility. *Academy of Management Perspectives*, in press.
- Edwards, J. R., & Cooper, C. L. (1988). The impacts of positive psychological states on physical health: A review and theoretical framework. *Social Science and Medicine*, 12, 1447-1459.
- Epel, E. S., Blackburn, E. H., Liu, J., Dhabhar, F. S., Adler, N. E., Morrow, J. D., & Cawthon, R. M. (2004). Accelerated telomere shortening in response to life stress. *PNAS: Proceedings of the National Academy of Sciences*, 101(49), 17323-17324.
- Erdogan, B., Bauer, T. N., Truxillo, D. M., & Mansfield, L. R. (2012). Whistle while you work: A review of the life satisfaction literature. *Journal of Management*, 38, 1038-1083.
- Estrada, C. A., Isen, A. M., & Young, M. J. (1997). Positive affect facilitates integration of information and decreases anchoring in reasoning among physicians. *Organizational Behavior and Human Decision Processes*, 72, 117-135.
- Felps, W., Mitchell, T. R., & Byington, E. (2006). How, when, and why bad apples spoil the barrel: Negative group members and dysfunctional groups. *Research in Organizational Behavior: An Annual Review Series of Analytic Essays and Critical Reviews*, 27, 175-222.
- Field, T., Diego, M., & Hernandez-Reif, M. (2006). Prenatal depression effects on the future of the newborn: A review. *Infant Behavior and Development*, 29, 445-455.
- Field, T., Diego, M., Hernandez-Reif, M., Deeds, O., Holder, V., Schanberg, S., & Kuhn, C. (2009). Depressed pregnant black women have a greater incidence of prematurity and low birthweight outcomes. *Infant Behavior and Development*, 32, 10-16.
- Forgas, J. P. (1998). On feeling good and getting your way: Mood effects on negotiator cognition and bargaining strategies. *Journal of Personality and Social Psychology*, 74, 565-577.
- Forgas, J. P. (2007). When sad is better than happy: Negative affect can improve the quality and effectiveness of persuasive messages and social influence. *Journal of Experimental Social Psychology*, 43, 513-528.
- Fossati, P., Ergis, A. M., & Allilaire, J. F. (2002). Executive functioning in unipolar depression: A review. *L'Encephale*, 28, 97-107.
- Fowler, J. H., & Christakis, N. A. (2008). Dynamic spread of happiness in a large social network: Longitudinal analysis over 20 years in the Framingham Heart Study. *British Medical Journal*, 337, a2338.
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology*, 2, 300-319.
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The Broaden-and-Build theory of positive emotions. *American Psychologist*, 56, 218-226.
- Fredrickson, B. L., Grewen, K. M., Coffey, K. A., Algoe, S. B., Firestone, A. M., Arevalo, J. M. G., . . . Cole, S. W. (2013). A functional genomic perspective on human well-being. *PNAS: Proceedings of the National Academy of Sciences*, doi:10.1073/pnas.1305419110.
- Fredrickson, B. L., & Branigan, C. (2005). Positive emotions broaden the scope of attention and thought-action repertoires. *Cognition and Emotion*, 19, 313-332.
- Fredrickson, B. L., & Levenson, R. W. (1998). Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *Cognition and Emotion*, 12, 191-220.
- Fredrickson, B. L., Mancuso, R. A., Branigan, C., & Tugade, M. M. (2000). The undoing effect of positive emotions. *Motivation and Emotion*, 24, 237-258.
- Fry, P. S. (1975). Affect and resistance to temptation. *Developmental Psychology*, 11, 466-472.
- Garg, N., Wansink, B., & Inman, J. J. (2007). The influence of incidental affect on consumers' food intake. *Journal of Marketing*, 71, 194-206.
- George, J. M., & Zhou, J. (2007). Dual tuning in a supportive context: Joint contributions of positive mood, negative mood, and supervisory behaviors to employee creativity. *Management Journal*, 50, 605-622.

- Gotlib, I. H., & Hammen, C. L. (2009) (Eds.). *Handbook of depression*. New York: Guilford Publications.
- Gotz, A. A., Martin, W., & Volker, S. (2008). Psychosocial maternal stress during pregnancy: Effects on reproduction for F0 and F1 generation laboratory rats. *Physiology and Behavior*, 93, 1055-1060.
- Goudie, R., Mukherjee, S., De Neve, J.-E., Oswald, A. J., & Wu, S. (forthcoming). Happiness as a driver of risk-avoiding behavior: A conceptual framework with an application to seatbelt wearing and automobile accidents. *Economica*.
- Graham, L., & Oswald, A.J. (2010). Hedonic capital, adaption and resilience. *Journal of Economic Behavior & Organization*, 76(2), 372-384.
- Graham, C., Eggers, A., & Sandip, S. (2004). Does happiness pay? An exploration based on panel data from Russia. *Journal of Economic Behavior and Organization*, 55, 319-342.
- Grant, N., Wardle, J., & Steptoe, A. (2009). The relationship between life satisfaction and health behaviour: A cross-cultural analysis of young adults. *International Journal of Behavioral Medicine*, 16, 259-268.
- Green, J. D., Sedikides, C., A., S. J., Wood, J. V., & Forzano, L. B. (2003). Happy mood decreases self-focused attention. *British Journal of Social Psychology*, 42, 147-157.
- Gruber, J., Mauss, I. B., & Tamir, M. (2011). A dark side of happiness: How, when, and why happiness is not always good. *Perspectives on Psychological Science*, 6, 222-233.
- Guyen, C. (2012). Reversing the question: Does happiness affect consumption and savings behavior? *Journal of Economic Psychology*, 33(4), 701-717.
- Harter, J. K., Schmidt, F. L., Asplund, J. W., Killham, E. A., & Agrawal, S. (2010). Causal impact of employee work perceptions on the bottom line of organizations. *Perspectives on Psychological Science*, 5, 378-389.
- Hertel, G., Neuhof, J., Theuer, T., & Kerr, N. L. (2000). Mood effects on cooperation in small groups: Does positive mood simply lead to more cooperation? *Cognition and Emotion*, 2000, 441-472.
- Hölzela, B.K., Carmody, J., Vangela M., Congleton, C., Yerramsetti, S.M., Garda, T., & Lazara, S.W. (2011). Mindfulness practice leads to increases in regional brain gray matter density. *Psychiatry Research*, 191(1), 36-43.
- Howell, R. T., Kern, M. L., & Lyubomirsky, S. (2007). Health benefits: Meta-analytically determining the impact of well-being on objective health outcomes. *Health Psychology Review*, 1, 83-136.
- Ifcher, J., & Zarghamee, H. (2011a). Happiness and time preference: The effect of positive affect in a random assignment experiment. *American Economic Review*, 101(7), 3109-3129.
- Ifcher, J., & Zarghamee, H. (2011b). Positive Affect and Overconfidence: A Laboratory Investigation. SCU Levey School of Business Research Paper No. 11-02.
- Ilies, R., Scott, B. A., & Judge, T. A. (2006). The interactive effects of personal traits and experienced states on intraindividual patterns of citizenship behavior. *Academy of Management*, 49, 561-575.
- Inglehart, R., Foa, R., Peterson, C., & Welzel, C. (2008). Development, freedom, and rising happiness: A global perspective (1981-2007). *Perspectives on Psychological Science*, 3, 264-285.
- Isen, A. M., Daubman, K. A., & Nowicki, G. P. (1987). Positive affect facilitates creative problem solving. *Journal of Personality and Positive Psychology*, 52, 1122-1131.
- Isen, A. M., Rosenzweig, A. S., & Young, M. J. (1991). The influence of positive affect on clinical problem solving. *Medical Decision Making*, 11, 221-227.
- Johnson, K. J., & Fredrickson, B. L. (2005). "We all look the same to me:" Positive emotions eliminate the own-race bias in face recognition. *Psychological Science*, 16, 875-881.
- Jovanovic, V., & Brdaric, D. (2012). Did curiosity kill the cat? Evidence from subjective well-being of adolescents. *Personality and Individual Differences*, 52, 380-384.
- Judge, T. A., & Kinger, R. (2007). Job satisfaction: Subjective well-being at work. In M. Eid & R. Larsen (Eds.), *The science of subjective well-being*. New York: Guilford Publications.
- Judge, T. A., Piccolo, R. F., Podsakoff, N. P., Shaw, J. C., & Rich, B. L. (2010). The relationship between pay and job satisfaction: A meta-analysis of the literature. *Journal of Vocational Behavior*, 77, 157-167.
- Judge, T. A., Scott, B. A., & Ilies, R. (2006). Hostility, job attitudes, and workplace deviance: Test of a multilevel model. *Journal of Applied Psychology*, 91, 126-138.

- Judge, T. A., Thoreson, C. J., Bono, J. E., & Patton, G. K. (2001). The job satisfaction-job performance relationship: A qualitative and quantitative review. *Psychological Bulletin*, *127*, 376-407.
- Kazdin, A. E., Esveltd-Dawson, K., & Matson, J. L. (1982). Changes in children's social skills performance as a function of preassessment experiences. *Journal of Clinical Child Psychology*, *11*, 243-248.
- Kessler, R. C. (2012). The costs of depression. *The Psychiatric Clinics of North America*, *35*, 1-14.
- Kiecolt-Glaser, J. K., McGuire, L., Robles, T. F., & Glaser, R. (2002). Emotions, morbidity, and mortality: New perspectives from psychoneuroimmunology. *Annual Review of Psychology*, *53*, 83-107.
- Koivumaa-Honkanen, H., Honkanen, R., Viinamaki, H., Heikkila, K., Kaprio, J., & Koskenvuo, M. (2001). Life satisfaction and suicide: A 20-year follow-up study. *American Journal of Psychiatry*, *158*, 433-439.
- Kok, B. E., Coffey, K. A., Cohn, M. A., Catalino, L. I., Vacharkulksemsuk, T., Algoe, S. B., Brantley, M., & Fredrickson, B. L. (2013). How positive emotions build physical health: Perceived positive social connections account for the upward spiral between positive emotions and vagal tone. *Psychological Science*, doi: 10.1177/0956797612470827.
- Krause, Annabelle (2012). Don't worry, be happy? Happiness and reemployment. *Discussion Paper Series, Forschungsinstitut zur Zukunft der Arbeit*, No. 7107.
- Kubzansky, L. D., Gilthorpe, M. S., & Goodman, E. (2012). A prospective study of psychological distress and weight status in adolescents/young adults. *Annals of Behavioral Medicine*, *43*, 219-228.
- Lawler, E. J., Thye, S. R., & Yoon, J. (2000). Emotion and group cohesion in productive exchange. *American Journal of Sociology* *106*, 616-657.
- Lawless, N. M., & Lucas, R. E. (2011). Predictors of regional well-being: A county level analysis. *Social Indicator Research*, *101*, 341-357.
- Lee, K., & Allen, N. J. (2002). Organizational citizenship behavior and workplace deviance: The role of affect and cognitions. *Journal of Applied Psychology*, *87*, 131-142.
- Leitzel, J. D. (2000). A confirmatory factor analytic investigation of the tripartite model of depression and anxiety in high school adolescents. Dissertation Abstracts International, 2000-95024-186 (Dissertation Number AA19976359).
- Lerner, J. S., Li, Y., & Weber, E. (2013). The financial cost of sadness. *Psychological Science* *24*, 72-79.
- Lount, J. R. B. (2010). The impact of positive mood on trust in interpersonal and intergroup interactions. *Journal of Personality and Social Psychology*, *98*, 420-433.
- Lucas, R. E., Diener, E., Grob, A., Suh, E. M., & Shao, L. (2000). Cross-cultural evidence for the fundamental features of extraversion. *Journal of Personality and Social Psychology*, *79*, 452-468.
- Luechinger, S. (2009). Valuing air quality using the life satisfaction approach. *The Economic Journal*, *119*, 482-515.
- Luhmann, M., Lucas, R. E., Eid, M., & Diener, E. (2013). The prospective effect of life satisfaction on life events. *Social Psychological and Personality Science*, *4*, 39-45.
- Lyubomirsky, S., King, L. A., & Diener, E. (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin*, *131*, 803-855.
- Lyubomirsky, S. & Boehm, J.K. (2010). Human Motives, Happiness, and the Puzzle of Parenthood: Commentary on Kenrick et al. *Perspectives on Psychology Science* *5*(3), 327-334.
- Marks, G. N., & Fleming, N. (1999). Influences and consequences of well-being among Australian young people: 1980-1995. *Social Indicators Research*, *46*, 301-323.
- Mehl, M. R., Vazire, S., Holleran, S. E., & Clark, C. S. (2010). Eavesdropping on happiness: Well-being is related to having less small talk and more substantive conversations. *Psychological Science*, *21*, 539-541.
- Morrison, M., Tay, L., & Diener, E. (2012). Subjective well-being across the lifespan worldwide. Paper submitted for publication, University of Western Ontario.
- Moum, T. (1996). Subjective well-being as a short- and long-term predictor of suicide in the general population. Paper presented at the World Conference in Quality of Life, University of Northern British Columbia, Prince George, Canada. August 22-25.

- Myers, D. G. (2000). The funds, friends, and faith of happy people. *American Psychologist*, 55, 56-67.
- Neggers, Y., Goldenberg, R., Cliver, S., & Hauth, J. (2006). The relationship between psychosocial profile, health practices, and pregnancy outcomes. *Acta Obstetrica et Gynecologica Scandinavica*, 85, 277-285.
- Nelson, D. W. (2009). Feeling good and open-minded: The impact of positive affect on cross cultural empathic responding. *Journal of Positive Psychology*, 4, 53-63.
- Oishi, S., Diener, E., & Lucas, R. (2007). The optimum level of well-being: Can people be too happy? *Perspectives on Psychological Science*, 2, 346-360.
- Ong, A. D. (2010). Pathways linking positive emotion and health in later life. *Current Directions in Psychological Science*, 19, 358-362.
- Organ, D. W., & Ryan, K. (1995). A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior. *Personnel Psychology*, 48, 775-802.
- Orr, S. T., & Miller, A. (1995). Maternal depressive symptoms and the risk of poor pregnancy outcome. *Epidemiologic Reviews*, 17, 165-171.
- Ostir, G. V., Markides, K. S., Peek, M. K., & Goodwin, J. S. (2001). The association between emotional well-being and the incidence of stroke in older adults. *Psychosomatic Medicine*, 63, 210-215.
- Oswald, A. J., Proto, E., & Sgroi, D. (2012). Happiness and productivity. University of Warwick, Manuscript submitted for publication.
- Pelled, L. H., & Xin, K. R. (1999). Down and out: An investigation of the relationship between mood and employee withdrawal behavior. *Journal of Management*, 25, 875-895.
- Peterson, S. J., Luthans, F., Avolio, B. J., Walumbwa, F. O., & Zhang, Z. (2011). Psychological capital and employee performance: A latent growth modeling approach. *Personnel Psychology*, 64, 427-450.
- Pettay, R. S. (2008). *Health behaviors and life satisfaction in college students*. Doctoral Dissertation, Kansas State University.
- Pressman, S. D., & Cohen, S. (2005). Does positive affect influence health? *Psychological Bulletin*, 131, 925-971.
- Pressman, S. D., & Cohen, S. (2012). Positive emotion word use and longevity in famous deceased psychologists. *Health Psychology*, 31, 297-305.
- Priller, E., & Schupp, J. (2011). Social and economic characteristics of financial and blood donors in Germany. *DIW Economic Bulletin*, 6, 23-30.
- Rasmussen, H. N., Scheier, M. F., & Greenhouse, J. B. (2009). Optimism and physical health: A review. *Annals of Behavioral Medicine*, 37, 239-256.
- Rietveld, C. A., Cesarini, D., Benjamin, D. J., Koellinger, P. D., De Neve, J.-E., Tiemeier, H., Johannesson, M., Magnusson, P., Pedersen, N. L., Krueger, R. F., & Bartels, M. (2013). Molecular genetics and subjective well-being. *PNAS: Proceedings of the National Academy of Sciences*, 110(24), 9692-9697.
- Riketta, M. (2008). The causal relation between job attitudes and performance: A meta-analysis of panel studies. *Journal of Applied Psychology*, 93, 472-481.
- Romera, I., Perez, V., Menchon, J. M., Delgado-Cohen, H., Polavieja, P., & Gilaberte, I. (2010). Social and occupational functioning impairment in patients in partial versus complete remission of a major depressive disorder episode. A six-month prospective epidemiological study. *European Psychiatry*, 25, 58-65.
- Rugulies, R. (2002). Depression as a predictor for coronary heart disease: A review and meta-analysis. *American Journal of Preventive Medicine*, 23, 51-61.
- Russ, T. C., Stamatakis, E., Hamer, M., Starr, J. M., Kivimaki, M., & Batty, G. D. (2012). Association between psychological distress and mortality: Individual participant pooled analysis of 10 prospective cohort studies. *British Medical Journal*, 31, 345.
- Schmitz, T.W., De Rosa, E., & Anderson, A.K. (2009). Opposing influences of affective state valence on visual cortical encoding. *Journal of Neuroscience*, 29, 7199-7207.
- Schneider, M., Graham, D., Grant, A., King, P., & Cooper, D. (2009). Regional brain activation and affective response to physical activity among healthy adolescents. *Biological Psychology*, 82, 246-252.
- Smith, T. W., Glazer, K., Ruiz, J. M., & Gallo, L. C. (2004). Hostility, anger, aggressiveness, and coronary heart disease: An interpersonal perspective on personality, emotion, and health. *Journal of Personality*, 72, 1217-1270.

- Slopen, N., Kubzansky, L. D., McLaughlin, K. A., & Koenen, K. C. (2012). Childhood adversity and inflammatory processes in youth: A prospective study. *Psychoneuroendocrinology*, in press.
- Snyder, H. R. (2012). Major depressive disorder is associated with broad impairments on neuropsychological measures of executive function: A meta-analysis and review. *Psychological Bulletin*, Advance online publication. doi: 10.1037/a0028727
- Spector, P. E., & Fox, S. (2002). An emotion-centered model of voluntary work behavior: Some parallels between counterproductive work behavior and organizational citizenship behavior. *Human Resource Management Review*, 12, 269-292.
- Steptoe, A., Dockray, S., & Wardle, J. (2009). Positive affect and psychobiological processes relevant to health. *Journal of Personality*, 77, 1747-1776.
- Steptoe, A., Wardle, J., & Marmot, M. (2005). Positive affect and health-related neuroendocrine, cardiovascular, and inflammatory processes. *PNAS: Proceedings of National Academy of Sciences*, 102, 6508-6512.
- Steptoe, A., & Wardle, J. (2011) Positive affect measured using ecological momentary assessment and survival in older men and women. *PNAS: Proceedings of National Academy of Sciences*, 108(45), 18244-18248.
- Strine, T. W., Mokdad, A. H., Balluz, L. S., Gonzalez, O., Crider, R., Berry, J. T., & Kroenke, K. (2008a). Depression and anxiety in the United States: Findings from the 2006 Behavioral Risk Factor Surveillance System. *Psychiatric Services*, 59, 1383-1390.
- Strine, T. W., Mokdad, A. H., Dube, S. R., Balluz, L. S., Gonzalez, O., Berry, J. T., Manderscheid, R., & Kroenke, K. (2008b). The association of depression and anxiety with obesity and unhealthy behaviors among community-dwelling US adults. *General Hospital Psychiatry*, 30, 127-137.
- Stutzer, A., & Frey, B. S. (2006). Does marriage make people happy, or do happy people get married? *Journal of Socio-Economics*, 35, 326-347.
- Tay, L., & Diener, E. (2011). Needs and subjective well-being. *Journal of Personality and Social Psychology*, 101, 354-365.
- Tay, L., Tan, K., Diener, E., & Gonzalez, E. (2012). Social relations, health behaviors, and health outcomes: A survey and synthesis. *Applied Psychology: Health and Well-Being*, in press.
- Watson, D., Clark, L. A., Weber, K., Assenheimer, J. S., Strauss, M. E., & McCormick, R. A. (1995). Testing a tripartite model: II. Exploring the symptom structure of anxiety and depression in student, adult, and patient samples. *Journal of Abnormal Psychology*, 104, 15-25.
- Weiss, A., Adams, M. J., & King, J. E. (2011). Happy orangutans live longer lives. *Biology Letters*, 7, 872-874.
- Wiest, M., Schuz, B., Webster, N., & Wurm, S. (2011). Subjective well-being and mortality revisited: Differential effects of cognitive and emotional facets of well-being on mortality. *Health Psychology*, 30, 728-735.
- Williamson, D. M., Abe, K., Bean, C., Ferre, C., Henderson, Z., & Lackritz, E. (2008). Current research in preterm birth. *Journal of Women's Health*, 17, 1545-1549.
- Wise, R.A. (2004). Dopamine, Learning, and Motivation. *Nature Reviews: Neuroscience*, 5, 1-12.
- Wisner, K. L., Sit, D. K. Y., Hanusa, B.H., Moses-Kolko, E. L., Bogen, D. L., Hunker, D. F., Perel, J. M., Jones-Ivy, S., Bodnar, L. M., & Singer, L.T. (2009). Major depression and antidepressant treatment: Impact on pregnancy and neonatal outcomes. *Focus*, 7, 374-384.
- Yang, J., & Diefendorff, J. M. (2009). The relations of daily counterproductive workplace behavior with emotions, situational antecedents, and personality moderators: A diary study in Hong Kong. *Personnel Psychology*, 62, 259-295.
- Zorrilla, E. P., Luborsky, L., McKay, J. R., Rosenthal, R., Houldin, A., Tax, A., McCorkle, R., Seligman, D. A., & Schmidt, K. (2001). The relationship of depression and stressors to immunological assays: A meta-analytic review. *Brain Behavior and Immunity*, 15, 199-226.



