Red strategy gets a higher frequency of medium-attraction and high-attraction (positive) responses

Blue strategy gets a higher frequency of low-attraction (negative) responses

Blue strategy gets a higher frequency of extreme-attraction (very positive) responses

The Science of Winning at Life

Scientific Self-Help: The State of Our Knowledge

Part of the sequence:

Some have suggested that the Less Wrong community could improve readers' instrumental rationality more effectively if it first caught up with the scientific literature on productivity and self-help, and then enabled readers to deliberately practice self-help skills and apply what they've learned in real life.

I think that's a good idea. My contribution today is a quick overview of scientific self-help: what professionals call "the psychology of adjustment." First I'll review the state of the industry and the scientific literature, and then I'll briefly summarize the scientific data available on three topics in self-help: study methods, productivity, and happiness.

The industry and the literature

As you probably know, much of the self-help industry is a sham, ripe for parody. Most self-help books are written to *sell*, not to *help*. Pop psychology may be more myth than fact. As Christopher Buckley (1999) writes, "The more people read [self-help books], the more they think they need them... [it's] more like an addiction than an alliance."

Where can you turn for reliable, empirically-based self-help advice? A few leading therapeutic psychologists (e.g., Albert Ellis, Arnold Lazarus, Martin Seligman) have written self-help books based on decades of research, but even these works tend to give recommendations that are still debated, because they aren't yet part of *settled* science.

Lifelong self-help researcher Clayton Tucker-Ladd wrote and updated *Psychological Self-Help* (pdf) over several decades. It's a summary of what scientists do and don't know about self-help methods (as of about 2003), but it's also more than 2,000 pages long, and much of it surveys scientific *opinion* rather than experimental results, because on many subjects there *aren't* any experimental results yet. The book is associated with an internet community of people sharing what does and doesn't work for them.

More immediately useful is Richard Wiseman's *59 Seconds*. Wiseman is an experimental psychologist and paranormal investigator who gathered together what little self-help research *is* part of settled science, and put it into a short, fun, and useful Malcolm Gladwell-ish book. The next best popular-level *general* self-help book is perhaps Martin Seligman's *What You Can Change and What You Can't*.

Two large books rate hundreds of popular self-help books according to what professional psychologists think of them, and offer advice on how to choose self-help books. Unfortunately, this may not mean much because even professional psychologists very often have opinions that depart from the empirical data, as documented extensively by Scott Lilienfeld and others in *Science and Pseudoscience in Clinical Psychology* and *Navigating the Mindfield*. These two books are helpful in assessing what is and isn't known according to *empirical research* (rather than

according to *expert opinion*). Lilienfeld also edits the useful journal [Scientific Review of Mental Health Practice](#), and has compiled a list of [harmful psychological treatments](#). Also see Nathan and Gorman's [*A Guide to Treatments That Work*](#), Roth & Fonagy's [What Works for Whom?](#)*,* and, more generally, Stanovich's [*How to Think Straight about Psychology*](#).

Many self-help books are written as "one size fits all," but of course this is rarely appropriate in psychology, and this leads to reader disappointment (Norem & Chang, 2000). But psychologists *have* tested the effectiveness of reading particular *problem-focused* self-help books ("bibliotherapy").[1] For example, [it appears that](#) reading David Burns' [*Feeling Good*](#) can be as effective for treating depression as individual or group therapy. Results vary from book to book.

There are at least four university textbooks that teach basic scientific self-help. The first is Weiten, Dunn, and Hammer's [*Psychology Applied to Modern Life: Adjustment in the 21st Century*](#). It's expensive, but you can [preview it here.](#) Others are are Santrock's [Human Adjustment](#), Duffy et al.'s [*Psychology for Living*](#), and Nevid & Rathus' [*Psychology and the Challenges of Life*](#).

If you read only one book of self-help in your life, I recommend Weiten, Dunn, and Hammer's [Psychology Applied to Modern Life](#).[2] Unfortunately, like Tucker-Ladd's *Psychological Self-Help*, many sections of the book are an overview of scientific *opinion* rather than *experimental result*, because so few experimental studies on the subject have been done!

In private correspondance with me, Weiten remarked:

> You are looking for substance in what is ultimately a black hole of empirical research ...Basically, almost everything written on the topic emphasizes the complete lack of evidence.

> Perhaps I am overly cynical, but I suspect that empirical tests are nonexistent because the authors of self-help and time-management titles are not at all confident that the results would be favorable. Hence, they have no incentive to pursue such research because it is likely to undermine their sales and their ability to write their next book. Another issue is that many of the authors who crank out these titles have little or no background in research. In a less cynical vein, another issue is that this research would come with all the formidable complexities of the research evaluating the effectiveness of different approaches to therapy. Efficacy trials for therapies are extremely difficult to conduct in a clean fashion and because of these complexities require big bucks in the way of grants.

Other leading researchers in the psychology of adjustment expressed much the same opinion of the field when I contacted them.

A sampling of scientific self-help advice

Still, perhaps scientific psychology can offer *some* useful self-help advice. I'll focus on two areas of *particular* interest to the Less Wrong community - [studying](#) and [productivity](#) - and on one area of *general* interest: [happiness](#).

Study methods

Organize for clarity the information you want to learn, for example in an outline (Einstein & McDaniel 2004; Tigner 1999; McDaniel et al. 1996). Cramming doesn't work (Wong 2006). Set up a schedule for studying (Allgood et al. 2000). *Test* yourself on the material (Karpicke & Roediger 2003; Roediger & Karpicke 2006a; Roediger & Karpicke 2006b; Agarwal et al. 2008; Butler & Roediger 2008), and do so repeatedly, with 24 hours or more between study sessions (Rohrer & Taylor 2006; Seabrook et al 2005; Cepeda et al. 2006; Rohrer et al. 2005; Karpicke & Roediger 2007). Basically: **use Anki**.

To retain studied information more effectively, try acrostics (Hermann et al. 2002), the link method (Iaccino 1996; Worthen 1997); and the method of loci (Massen & Vaterrodt-Plunnecke 2006; Moe & De Beni 2004; Moe & De Beni 2005).

Productivity

Unfortunately, there have been fewer experimental studies on effective productivity and time management methods than there have been on effective study methods. For an overview of scientific *opinion* on productivity, I recommend pages 121-126 of *Psychology Applied to Modern Life*. According to those pages, common advice from professionals includes:

1. Doing the *right* tasks is more important than doing your tasks *efficiently*. In fact, too much concern for efficiency is a leading cause of procrastination. Say "no" more often, and use your time for tasks that really matter.
2. Delegate responsibility as often as possible. Throw away unimportant tasks and items.
3. Keep a record of your time use. (Quantified Self can help.)
4. Write down your goals. Break them down into smaller goals, and break these into manageable tasks. Schedule these tasks into your calendar.
5. Process notes and emails only once. Tackle one task at a time, and group similar tasks together.
6. Make use of your downtime (plane rides, bus rides, doctor's office waitings). These days, many of your tasks can be completed on your smartphone.

Why the dearth of experimental research on productivity? A leading researcher on the topic, Piers Steel, explained to me in personal communication:

Fields tend to progress from description to experimentation, and the procrastination field is just starting to move towards that direction. There really isn't very much directly done on procrastination, but there is more for the broader field of self-regulation… it should transfer as the fundamentals are the same. For example, I would bet everything I own that goal setting works, as there [are] about [a thousand studies] on it in the motivational field (just not specifically on procrastination). On the other hand, we are building a behavioral lab so we can test many of these techniques head to head, something that sorely needs to be done.

Steel's book on the subject is The Procrastination Equation, which I highly recommend.

Happiness

There is an abundance of research on factors that correlate with *subjective well-being* (individuals' own assessments of their happiness and life satisfaction).

Factors that *don't correlate* much with happiness include: age,[3] gender,[4] parenthood,[5] intelligence,[6] physical attractiveness,[7] and money[8] (as long as you're above the poverty line). Factors that *correlate moderately* with happiness include: health,[9] social activity,[10] and religiosity.[11] Factors that *correlate strongly* with happiness include: genetics,[12] love and relationship satisfaction,[13] and work satisfaction.[14]

For many of these factors, a *causal* link to happiness has also been demonstrated with some confidence, but that story is too complicated to tell in this short article.

Conclusions

Many compassionate professionals have modeled their careers after George Miller's (1969) call to "give psychology away" to the masses as a means of promoting human welfare. As a result, hundreds of experimental studies have been done to test which self-help methods work, and which do not. We humans can use this knowledge to achieve our goals.

But much work remains to be done. Many features of human psychology and behavior are not well-understood, and many self-help methods recommended by popular and academic authors have not yet been experimentally tested. If you are considering psychology research as a career path, and you want to (1) improve human welfare, (2) get research funding, (3) explore an under-developed area of research, and (4) have the chance to write a best-selling self-help book once you've done some of your research, then please consider a career of *experimentally testing different self-help methods*. Humanity will thank you for it.

Next post: How to Beat Procrastination

Notes

[1] Read a nice overview of the literature in Bergsma, "Do Self-Help Books Help?" (2008).

[2] I recommend the 10th edition, which has large improvements over the 9th edition, including 4500 new citations.

[3] Age and happiness are unrelated (Lykken 1999), age accounting for less than 1% of the variation in people's happiness (Inglehart 1990; Myers & Diener 1997).

[4] Despite being treated for depressive disorders twice as often as men (Nolen-Hoeksema 2002), women report just as high levels of well-being as men do (Myers 1992).

[5] Apparently, the joys and stresses of parenthood balance each other out, as people with and without children are equally happy (Argyle 2001).

[6] Both IQ and educational attainment appear to be unrelated to happiness (Diener et al. 2009; Ross & Van Willigen 1997).

[7] Good-looking people enjoy huge advantages, but do not report greater happiness than others (Diener et al. 1995).

[8] The correlation between income and happiness is surprisingly weak (Diener & Seligman 2004; Diener et al. 1993; Johnson & Krueger 2006). One problem may be that higher income contributes to greater materialism, which impedes happiness (Frey & Stutzer 2002; Kasser et al. 2004; Solberg et al. 2002; Kasser 2002; Van Boven 2005; Nickerson et al. 2003; Kahneman et al. 2006).

[9] Those with disabling health conditions are happier than you might think (Myers 1992; Riis et al. 2005; Argyle 1999).

[10] Those who are satisfied with their social life are moderately more happy than others (Diener & Seligman 2004; Myers 1999; Diener & Seligman 2002).

[11] Religiosity correlates with happiness (Abdel-Kahlek 2005; Myers 2008), though it may be religious attendance and not religious belief that matters (Chida et al. 2009).

[12] Past happiness is the best predictor of future happiness (Lucas & Diener 2008). Happiness is surprisingly unmoved by external factors (Lykken & Tellegen 1996), because the genetics accounts for about 50% of the variance in happiness (Lyubomirsky et al. 2005; Stubbe et al. 2005).

[13] Married people are happier than those who are single or divorced (Myers & Diener 1995; Diener et al. 2000), and marital satisfaction predicts happiness (Proulx et al. 2007).

[14] Unemployment makes people very unhappy (Argyle 2001), and job satisfaction is strongly correlated with happiness (Judge & Klinger 2008; Warr 1999).

References

Abdel-Khalek (2006). "Happiness, health, and religiosity: Significant relations." *Mental Health*, 9(1): 85-97.

Agarwal, Karpicke, Kang, Roediger, & McDermott (2008). "Examining the testing effect with open- and closed-book tests." *Applied Cognitive Psychology*, 22: 861-876.

Allgood, Risko, Alvarez, & Fairbanks (2000). "Factors that influence study." In Flippo & Caverly, (Eds.), *Handbook of college reading and study strategy research*. Mahwah, NJ: Erlbaum.

Argyle (1999). "Causes and correlates of happiness." In Kahneman, Diener, & Schwartz (Eds.), *Well-being: The foundations of hedonic psychology*. New York: Sage.

Argyle (2001). *The Psychology of Happiness* (2nd ed.). New York: Routledge.

Buckley (1998). *God is My Broker: A Monk-Tycoon Reveals the 7 1/2 Laws of Spiritual and Financial Growth*. New York: Random House.

Butler & Roediger (2008). "Feedback enhances the positive effects and reduces the negative effects of multiple-choice testing." *Memory & Cognition*, 36(3).

Chida, Steptoe, & Powell (2009). "Religiosity/Spirituality and Mortality." *Psychotherapy and Psychosomatics*, 78(2): 81-90.

Cepeda, Pashler, Vul, Wixted, & Rohrer (2006). "Distributed practice in verbal recall tasks: A review and quantitative synthesis." *Psychological Bulletin*, 132: 354-380.

Diener, Sandvik, Seidlitz, & Diener (1993). "The relationship between income and subjective well-being: Relative or absolute?" *Social Indicators Research*, 28: 195-223.

Diener, Wolsic, & Fujita (1995). "Physical attractiveness and subjective well-being." *Journal of Personality and Social Psychology*, 69: 120-129.

Diener, Gohm, Suh, & Oishi (2000). "Similarity of the relations between marital status and subjective well-being across cultures." *Journal of Cross-Cultural Psychology*, 31: 419-436.

Diener & Seligman (2002). "Very happy people." *Psychological Science*, 13: 80-83.

Diener & Seligman (2004). "Beyond money: Toward an economy of well-being." *Psychological Science in the Public Interest*, 5(1): 1-31.

Diener, Kesebir, & Tov (2009). "Happiness" In Leary & Hoyle (Eds.), *Handbook of Individual Differences in Social Behavior* (pp. 147-160). New York: Guilford.

Einstein & McDaniel (2004). *Memory Fitness: A Guide for Successful Aging*. New Haven, CT: Yale University Press.

Frey & Stutzer (2002). "What can economists learn from happiness research?" *Journal of Economic Literature*, 40: 402-435.

Hermann, Raybeck, & Gruneberg (2002). *Improving memory and study skills: Advances in theory and practice.* Ashland, OH: Hogrefe & Huber.

Iaccino (1996). "A further examination of the bizarre imagery mnemonic: Its effectiveness with mixed context and delayed testing. *Perceptual & Motor Skills*, 83: 881-882.

Inglehart (1990). *Culture shift in advanced industrial society*. Princeton, NJ: Princeton University Press.

Johnson & Krueger (2006). "How money buys happiness: Genetic and environmental processes linking finances and life satisfaction." *Journal of Personality and Social Psychology*, 90: 680-691.

Judge & Klinger (2008). "Job satisfaction: Subjective well-being at work." In Eid & Larsen (Eds.), *The science of subjective well-being* (pp. 393-413). New York: Guilford.

Kahneman, Krueger, Schkade, Schwarz, & Stone (2006). "Would you be happier if you were richer? A focusing illusion." *Science*, 312: 1908-1910.

Kasser (2002). *The high prices of materialism*. Cambridge, MA: MIT Press.

Kasser, Ryan, Couchman, & Sheldon (2004). "Materialistic values: Their causes and consequences." In Kasser & Kanner (Eds.), *Psychology and consumer culture: The struggle for a good life in a materialistic world*. Washington DC: American Psychological Association.

Karpicke & Roediger (2003). "The critical importance of retrieval for learning." *Science*, 319: 966-968.

Karpicke & Roediger (2007). "Expanding retrieval practice promotes short-term retention, but equally spaced retrieval enhances long-term retention." *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 33(4): 704-719.

Lucas & Diener (2008). "Personality and subjective well-being." In John, Robins, & Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 796-814). New York: Guilford.

Lyubomirsky, Sheldon, & Schkade (2005). "Pursuing happiness: The architecture of sustainable change." *Review of General Psychology*, 9(2), 111-131.

Lykken & Tellegen (1996). "Happiness is a stochastic phenomenon." *Psychological Science*, 7: 186-189.

Lykken (1999). *Happiness: The nature and nurture of joy and contentment*. New York: St. Martin's.

Massen & Vaterrodt-Plunnecke (2006). "The role of proactive interference in mnemonic techniques." *Memory*, 14: 189-196.

McDaniel, Waddill, & Shakesby (1996). "Study strategies, interest, and learning from Text: The application of material appropriate processing." In Herrmann, McEvoy, Hertzog, Hertel, & Johnson (Eds.), *Basic and applied memory research: Theory in context* (Vol 1). Mahwah, NJ: Erlbaum.

Miller (1969). "On turning psychology over to the unwashed." *Psychology Today*, 3(7), 53–54, 66–68, 70, 72, 74.

Moe & De Beni (2004). "Studying passages with the loci method: Are subject-generated more effective than experimenter-supplied loci?" *Journal of Mental Imagery*, 28(3-4): 75-86.

Moe & De Beni (2005). "Stressing the efficacy of the Loci method: oral presentation and the subject-generation of the Loci pathway with expository passages." *Applied Cognitive Psychology*, 19(1): 95-106.

Myers (1992). *The pursuit of happiness: Who is happy, and why*. New York: Morrow.

Myers & Diener (1995). "Who is happy?" *Psychological Science*, 6: 10-19.

Myers & Diener (1997). "The pursuit of happiness." *Scientific American, Special Issue 7*: 40-43.

Myers (1999). "Close relationships and quality of life." In Kahnemann, Diener, & Schwarz (Eds.), *Well-being: The foundations of hedonic psychology*. New York: Sage.

Myers (2008). "Religion and human flourishing." In Eid & Larsen (Eds.), *The science of subjective well-being* (pp. 323-346). New York: Guilford.

Nickerson, Schwartz, Diener, & Kahnemann (2003). "Zeroing in on the dark side of the American dream: A closer look at the negative consequences of the goal for financial success." *Psychological Science*, 14(6): 531-536.

Nolen-Hoeksema (2002). "Gender differences in depression." In Gotlib & Hammen (Eds.), *Handbook of Depression*. New York: Guilford.

Proulx, Helms, & Cheryl (2007). "Marital quality and personal well-being: A Meta-analysis." *Journal of Marriage and Family*, 69: 576-593.

Roediger & Karpicke (2006a). "Test-enhanced learning: Taking memory tests improves long-term retention." *Psychological Science*, 17: 249-255.

Roediger & Karpicke (2006b). "The power of testing memory: Basic research and implications for educational practice." *Perspectives on Psychological Science*, 1(3): 181-210.

Riis, Loewenstein, Baron, Jepson, Fagerlin, & Ubel (2005). "Ignorance of hedonic adaptation to hemodialysis: A study using ecological momentary assessment." *Journal of Experimental Psychology: General*, 134: 3-9.

Rohrer & Taylor (2006). "The effects of over-learning and distributed practice on the retention of mathematics knowlege. *Applied Cognitive Psychology*, 20: 1209-1224.

Rohrer, Taylor, Pashler, Wixted, & Cepeda (2005). "The Effect of Overlearning on Long-Term Retention." *Applied Cognitive Psychology*, 19: 361-374.

Ross & Van Willigen (1997). "Education and the subjective quality of life." *Journal of Health & Social Behavior*, 38: 275-297.

Seabrook, Brown, & Solity (2005). "Distributed and massed practice: From laboratory to class-room." *Applied Cognitive Psychology*, 19(1): 107-122.

Solberg, Diener, Wirtz, Lucas, & Oishi (2002). "Wanting, having, and satisfaction: Examining the role of desire discrepancies in satisfaction with income." *Journal of Personality and Social Psychology*, 83(3): 725-734.

Stubbe, Posthuma, Boomsa, & De Geus (2005). "Heritability and life satisfaction in adults: A twin-family study." *Psychological Medicine*, 35: 1581-1588.

Tigner (1999). "Putting memory research to good use: Hints from cognitive psychology." *College Teaching*, 47(4): 149-151.

Van Boven (2005). "Experientialism, materialism, and the pursuit of happiness." *Review of General Psychology*, 9(2): 132-142.

Warr (1999). "Well-being and the workplace." In Kahneman, Diener, & Schwartz (Eds.), *Well-being: The foundations of hedonic psychology*. New York: Sage.

Wong (2006). *Essential Study Skills*. Boston: Houghton Mifflin.

Worthen (1997). "Resiliency of bizarreness effects under varying conditions of verbal and imaginal elaboration and list composition. *Journal of Mental Imagery*, 21: 167-194.

How to Beat Procrastination

Part of the sequence:

> My own behavior baffles me. I find myself doing what I hate, and not doing what I really want to do!

- Saint Paul (Romans 7:15)

Once you're trained in BayesCraft, it may be tempting to tackle classic problems "from scratch" with your new Rationality Powers. But often, it's more effective to do a bit of scholarship first and at least *start* from the state of our scientific knowledge on the subject.

Today, I want to tackle **procrastination** by summarizing what we know about it, and how to overcome it.

Let me begin with three character vignettes...

Eddie attended the sales seminar, read all the books, and repeated the self-affirmations in the mirror this morning. But he has yet to make his first sale. Rejection after rejection has demoralized him. He organizes his desk, surfs the internet, and puts off his cold calls until potential clients are leaving for the day.

Three blocks away, Valerie stares at a blank document in Microsoft Word. Her essay assignment on municipal politics, due tomorrow, is mind-numbingly dull. She decides she needs a break, texts some friends, watches a show, and finds herself even less motivated to write the paper than before. At 10pm she dives in, but the result reflects the time she put into it: it's terrible.

In the next apartment down, Tom is ahead of the game. He got his visa, bought his plane tickets, and booked time off for his vacation to the Dominican Republic. He still needs to reserve a hotel room, but that can be done anytime. Tom keeps pushing the task forward a week as he has more urgent things to do, and then forgets about it altogether. As he's packing, he remembers to book the room, but by now there are none left by the beach. When he arrives, he finds his room is 10 blocks from the beach and decorated with dead mosquitos.

Eddie, Valerie, and Tom are all procrastinators, but in different ways.[1]

Eddie's problem is *low expectancy*. By now, he expects only failure. Eddie has low expectancy of success from making his next round of cold calls. Results from 39 procrastination studies show that low expectancy is a major cause of procrastination.[2] You doubt your ability to follow through with the diet. You don't expect to get the job. You really should be going out and meeting girls and learning to flirt better, but you expect only rejection now, so you procrastinate. You have learned to be helpless.

Valerie's problem is that her task has *low value* for her. We all put off what we *dislike*.[3] It's easy to meet up with your friends for drinks or start playing a videogame; not so easy to start doing your taxes. This point may be obvious, but it's nice to see it confirmed in over a dozen scientific studies. We put off things we don't like to do.

But the *strongest* predictor of procrastination is Tom's problem: *impulsiveness*. It would have been easy for Tom to book the hotel in advance, but he kept getting distracted by more urgent or interesting things, and didn't remember to book the hotel until the last minute,

which left him with a poor selection of rooms. Dozens of studies have shown that procrastination is closely tied to impulsiveness.[4]

Impulsiveness fits into a broader component of procrastination: *time*. An event's impact on our decisions decreases as its temporal distance from us increases.[5] We are less motivated by delayed rewards than by immediate rewards, and the more impulsive you are, the more your motivation is affected by such delays.

Expectancy, value, delay, and impulsiveness are the four major components of procrastination. Piers Steel, a leading researcher on procrastination, explains:

> Decrease the certainty or the size of a task's reward - its expectancy or its value - and you are unlikely to pursue its completion with any vigor. Increase the delay for the task's reward and our susceptibility to delay - impulsiveness - and motivation also dips.

The Procrastination Equation

This leaves us with "the procrastination equation":

$$Motivation = \frac{Expectancy \times Value}{Impulsiveness \times Delay}$$

Though we are always learning more, the procrastination equation accounts for every major finding on procrastination, and draws upon our best current theories of motivation.[6]

Increase the size of a task's reward (including both the pleasantness of doing the task and the value of its after-effects), and your motivation goes up. Increase the perceived *odds* of getting the reward, and your motivation also goes up.

You might have noticed that this part of the equation is one of the basic equations of the expected utility theory at the heart of economics. But one of the major criticisms of standard economic theory was that it did not account for time. For example, in 1991 George Akerlof pointed out that we irrationally find *present* costs more salient than *future* costs. This led to the flowering of behavioral economics, which integrates time (among other things).

Hence the denominator, which covers the effect of *time* on our motivation to do a task. The longer the delay before we reap a task's reward, the less motivated we are to do it. And the negative effect of this delay on our motivation is *amplified* by our level of impulsiveness. For highly impulsive people, delays do even *greater* damage to their motivation.

The Procrastination Equation in Action

As an example, consider the college student who must write a term paper.[7] Unfortunately for her, colleges have created a perfect storm of procrastination components. First, though the value of the paper for her *grades* may be high, the more immediate value is *very low*, assuming she dreads writing papers as much as most college students do.[8] Moreover, her *expectancy* is probably low. Measuring performance is hard, and any essay re-marked by another professor may get a very different grade: a B+ essay will get an A+ if she's lucky, or a C+ if she's unlucky.[9] There is also a large *delay*, since the paper is due at the end of the semester. If our college student has an impulsive personality, the negative effect of this

delay on her motivation to write the paper is greatly amplified. Writing a term paper is grueling (low value), the results are uncertain (low expectancy), and the deadline is far away (high delay).

But there's more. College dorms, and college campuses in general, might be the most distracting places on earth. There are *always* pleasures to be had (campus clubs, parties, relationships, games, events, alcohol) that are reliable, immediate, and intense. No wonder that the task of writing a term paper can't compete. These potent distractions amplify the negative effect of the delay in the task's reward and the negative effect of the student's level of impulsiveness.

How to Beat Procrastination

Although much is known about the neurobiology behind procrastination, I won't cover that subject here.[10] Instead, let's jump right to the *solutions* to our procrastination problem.

Once you know the procrastination equation, our general strategy is obvious. Since there is usually little you can do about the *delay* of a task's reward, we'll focus on the three terms of the procrastination equation over which we have some control. To beat procrastination, we need to:

1. Increase your *expectancy* of success.
2. Increase the task's *value* (make it more pleasant and rewarding).
3. Decrease your *impulsiveness*.

You might think these things are out of your control, but researchers have found several useful methods for achieving each of them.

Most of the advice below is taken from the best book on procrastination available, Piers Steel's *The Procrastination Equation*, which explains these methods *and others* in more detail.

Optimizing Optimism

If you don't think you can succeed, you'll have little motivation to do the task that needs doing. You've probably heard the advice to "Be positive!" But how? So far, researchers have identified three major techniques for increasing optimism: Success Spirals, Vicarious Victory, and Mental Contrasting.

Success Spirals

One way to build your optimism for success is to make use of *success spirals*.[11] When you achieve one challenging goal after another, your obviously gain confidence in your ability to succeed. So: give yourself a series of meaningful, challenging but achievable goals, and then achieve them! Set yourself up for success by doing things you know you can succeed at, again and again, to keep your confidence high.

Steel recommends that for starters, "it is often best to have process or learning goals rather than product or outcome goals. That is, the goals are acquiring or refining new skills or steps (the process) rather than winning or getting the highest score (the product)."[12]

Wilderness classes and adventure education (rafting, rock-climbing, camping, etc.) are *excellent* for this kind of thing.[13] Learn a new skill, be it cooking or karate. Volunteer for more

responsibilities at work or in your community. Push a favorite hobby to the next level. The key is to achieve one goal after another and pay attention to your successes.[14] Your brain will reward you with increased *expectancy* for success, and therefore a better ability to beat procrastination.

Vicarious Victory

Pessimism and optimism are both contagious.[15] Wherever you are, you probably have access to community groups that are great for fostering positivity: [Toastmasters](#), [Rotary](#), [Elks](#), [Shriners](#), and other local groups. I recommend you visit 5-10 such groups in your area and join the best one.

You can also boost your optimism by [watching inspirational movies](#), [reading inspirational biographies](#), and [listening to motivational speakers](#).

Mental Contrasting

Many popular self-help books encourage *creative visualization*, the practice of regularly and vividly imagining what you want to achieve: a car, a career, an achievement. Surprisingly, research shows this method can actually *drain* your motivation.[16]

Unless, that is, you add a second *crucial* step: *mental contrasting*. After imagining what you want to achieve, mentally contrast that with where you are now. Visualize your old, rusty car and your small paycheck. This presents your current situation as an obstacle to be overcome to achieve your dreams, and jumpstarts planning and effort.[17]

Guarding Against Too Much Optimism

Finally, I should note that *too much* optimism can also be a problem,[18] though this is less common. For example, too much optimism about [how long a task will take](#) may cause you to put it off until the last minute, which turns out to be too late. Something like Rhonda Byrne's [*The Secret*](#) may be *too* optimistic.

How can you guard against too much optimism? Plan for the worst but hope for the best.[19] Pay attention to how you procrastinate, make backup plans for failure, but then use the methods in this article to succeed as much as possible.

Increasing Value

It's hard to be motivated to do something that doesn't have much value to us - or worse, is downright *unpleasant*. The good news is that value is to some degree *constructed* and *relative*. The malleability of value is a well-studied area called *psychophysics*,[20] and researchers have some advice for how we can inject value into necessary tasks.

Flow

If the task you're avoiding is *boring*, try to make it more difficult, right up to the point where the difficulty level matches your current skill, and you achieve "flow."[21] This is what the state troopers of *Super Troopers* did: they devised strange games and challenges to make their boring job passable. [Myrtle Young](#) made her boring job at a potato chip factory more interesting and challenging by looking for potato chips that resembled celebrities and pulling them off the conveyor belts.

Meaning

It also helps to make sure tasks are connected to something you care about for its own sake,[22] at least through a chain: you read the book so you can pass the test so you can get the grade so you can get the job you want and have a fulfilling career. Breaking the chain leaves a task feeling meaningless.

Energy

Obviously, tasks are harder when you don't have much energy.[23] Tackle tasks when you are most alert. This depends on your circadian rhythm,[24] but most people have the most energy during a period starting a few hours after they wake up and lasting 4 hours.[25] Also, make sure to get enough sleep and exercise regularly.[26]

Other things that have worked for many people are:

- Drink lots of water.
- Stop eating anything that contains wheat and other grains.
- Use drugs (especially [modafinil](#)) as necessary.
- Do short but intense exercise once a week.
- When tired, splash cold water on your face or take a shower or do jumping jacks or go running.
- Listen to music that picks up your mood.
- De-clutter your life, because clutter is cognitively exhausting for your brain to process all day long.

Rewards

One obvious way to inject more value into a task is to *reward yourself for completing it*.[27]

Also, mix bitter medicine with sweet honey. Pair a long-term interest with a short-term pleasure.[28] Find a workout partner whose company you enjoy. Treat yourself to a specialty coffee when doing your taxes. I bribe myself with [Pinkberry frozen yogurt](#) to do things I hate doing.

Passion

Of course, the most *powerful* way to increase the value of a task is to focus on doing what you love wherever possible. It doesn't take much extra motivation for me to [research meta-ethics](#) or write [summaries of scientific self-help](#): that is what I love to do. Some people who

love playing video games have made [careers](#) out of it. To figure out which career might be full of tasks that you love to do, taking a [RIASEC](#) personality test might help. In the USA, [O*NET](#) can help you find jobs that are in-demand and fit your personality.

Handling Impulsiveness

Impulsiveness is, on average, the biggest factor in procrastination. Here are two of Steel's (2010a) methods for dealing with impulsiveness.

Commit Now

[Ulysses](#) did not make it past the beautiful singing [Sirens](#) with *willpower*. Rather, he knew his weaknesses and so he committed in advance to sail past them: he literally tied himself to his ship's mast. Several forms of *precommitment* are useful in handling impulsiveness.[29]

One method is to "throw away the key": Close off tempting alternatives. Many people see a productivity boost when they decide not to allow a TV in their home; I haven't owned one in years. But now, TV and more is available on the internet. To block that, you might need a tool like [RescueTime](#). Or, unplug your router when you've got work to do.

Another method is to make failure *really painful*. The website [stickK](#) lets you set aside money you will *lose* if you don't meet your goal, and ensures that you have an outside referee to decide whether your met your goal or not. To "up the ante," set things up so that your money will go to an organization you *hate* if you fail. And have your chosen referee agree to post the details of your donation to Facebook if you don't meet your goal.

Set Goals

Hundreds of books stress SMART goals: goals that are Specific, Measurable, Attainable, Realistic, and Time-Anchored.[30] Is this recommendation backed by good research? Not quite. First, notice that Attainable is redundant with Realistic, and Specific is Redundant with Measurable and Time-Anchored. Second, important concepts are *missing*. Above, we emphasized the importance of goals that are challenging (and thus, lead to "flow") and meaningful (connected to things you desire for their own sake).

It's also important to break up goals into lots of smaller subgoals which, by themselves, are easier to achieve and have more immediate deadlines. Typically, *daily* goals are frequent enough, but it can also help to set an immediate goal to break you through the "getting started" threshold. Your first goal can be "Write the email to the producer," and your next goal can be the daily goal. Once that first, 5-minute task has been completed, you'll probably already be on your way to the larger daily goal, even if it takes 30 minutes or 2 hours.[31]

Also: Are your goals measuring inputs or outputs? Is your goal to *spend 30 minutes on X* or is it to *produce final product X*? Try it different ways for different tasks, and see what works for you.

Because we are creatures of habit, it helps to get into a routine.[32] For example: Exercise at the same time, every day.

Conclusion

So there you have it. To beat procrastination, you need to increase your motivation to do each task on which you are tempted to procrastinate. To do that, you can (1) optimize your optimism for success on the task, (2) make the task more pleasant, and (3) take steps to overcome your impulsiveness. And to do each of *those* things, use the specific methods explained above (set goals, pre-commit, make use of success spirals, etc.).

A warning: Don't try to be perfect. Don't try to completely *eliminate* procrastination. Be real. Overregulation will make you unhappy. You'll have to find a balance.

But now you have the tools you need. Identify which parts of the procrastination equation need the most work in your situation, and figure out which methods for dealing with that part of the problem work best for you. Then, go out there and make yourself stronger, score that job, and help save the world!

(And, read *The Procrastination Equation* if you want more detail than I included here.)

Notes

[1] These are the fictional characters used to illustrate the procrastination equation in Steel (2010a).

[2] Expectancy corresponds most closely to the commonly measured trait of "self efficacy." The relatively strong correlation between low self-efficacy and procrastination (across 39 studies) is shown table 3 of Steel (2007).

[3] In a recent post, Eliezer Yudkowsky claimed that "on a moment-to-moment basis, being in the middle of doing the work is usually less painful than being in the middle of procrastinating." Thus, "when you procrastinate, you're probably not procrastinating because of the pain of working." That might be true for Eliezer in particular, but studies on procrastination suggest it's not true for most people. The pain of doing a task *is* a major factor contributing to procrastination. This is known as the problem of *task aversiveness* (Brown 1991; Burka & Yuen 1983; Ellis & Knauss 1977), also known as the problem of *task appeal* (Harris & Sutton, 1983) or as the *dysphoric affect* (Milgram, Sroloff, & Rosenbaum, 1988). For an overview of additional literature demonstrating this point, see page 75 of Steel (2007).

[4] For an overview of the correlation between impulsiveness and procrastination, see pages 76-79 and 81 of Steel (2007).

[5] This is recognized as one of the psychological laws of learning (Schwawrtz, 1989), and plays a role in the dominant economic role of discounted utility (Loewenstein & Elster, 1992). In particular, see the work on *temporal construal theory* (Trope & Liberman, 2003).

[6] The procrastination equation is called *temporal motivational theory* (TMT). See Steel (2007) on how TMT accounts for every major finding on procrastination. See Steel & Konig (2006) on how TMT draws upon and integrates our best psychological theories of motivation. There are other theories of procrastination - the most popular may be the decisional-avoidant-arousal

theory proposed by Ferrari (1992). But a recent meta-analysis shows that TMT is more consistent with the data (Steel, 2010b). An **important note** is that the full version of TMT places a constant in the denominator to prevent the denominator from skyrocketing into infinity as delay approaches 0. Also, 'impulsiveness' here is a substitute for 'susceptibility to delay,' something which may vary by task, whereas 'impulsiveness' sounds like a stable character trait that might not help to explain having different motivations to perform different tasks.

[7] This example taken from Steel (2010a). Academic procrastination is the most-studied kind of procrastination (McCown & Roberts, 1994).

[8] Even George Orwell hated writing. He wrote: "Writing a book is a horrible, exhausting struggle, like a long bout of some painful illness."

[9] See Cannings et al. (2005) and Newstead (2002).

[10] Read chapter 3 of Steel (2010a).

[11] In business academia, success spirals are known as "efficacy-performance spirals" or "efficacy-performance deviation amplifying loops". See Lindsley et al. (1995).

[12] See Steel (2010a), note 9 in chapter 7.

[13] See Hans (2000), Feldman & Matjasko (2005), and World Organization of the Scout Movement (1998).

[14] Zimmerman (2002).

[15] Aarts et al. (2008), Armitage & Conner (2001), Rivs & Sheeran (2003), van Knippenberg et al. (2004).

[16] Levin & Spei (2004), Rhue & Lynn (1987), Schneider (2001), Waldo & Merritt (2000).

[17] Achtziger et al. (2008), Oettingen et al. (2005), Oettingen & Thorpe (2006), Kavanagh et al. (2005), Pham & Taylor (1999).

[18] Sigall et al. (2000).

[19] Aspinwall (2005).

[20] A good overview is Weber (2003).

[21] Csikszentmihalyi (1990).

[22] Miller & Brickman (2004), Schraw & Lehman (2001), Wolters (2003).

[23] Steel (2007), Gropel & Steel (2008).

[24] Furnham (2002).

[25] Klein (2009).

[26] Oaten & Cheng (2006).

[27] Bandura (1976), Febbraro & Clum (1998), Ferrari & Emmons (1995). This is known as *learned industriousness*, *impulse pairing* or *impulse fusion*. See Eisenberger (1992), Renninger (2000), Stromer et al. (2000).

[28] Ainslie (1992).

[29] Ariely & Wertenbroch (2002) and Schelling (1992).

[30] Locke & Latham (2002).

[31] Gropel & Steel (2008), Steel (2010a).

[32] Diefendorff et al. (2006), Gollwitzer (1996), Silver (1974).

References

Aarts, Dijksterhuis, & Dik (2008). Goal contagion: Inferring goals from others' actions - and what it leads to. In Shah & Gardner (Eds.), *Handbook of motivation* (pp. 265-280). New York: Guilford Press.

Achtziger, Fehr, Oettingen, Gollwitzer, & Rockstroh (2008). Strategies of intention formation are reflected in continuous MEG activity. *Social Neuroscience, 4(1)*, 1-17.

Ainslie (1992). *Picoeconomics: The strategic interaction of successive motivational states within the person*. New York: Cambridge University Press.

Ariely & Wertenbroch (2002). Procrastination, deadlines, and performance: Self-control by precommitment. *Psychological Science, 13(3)*: 219-224.

Armitage & Conner (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology, 40(4)*: 471-499.

Aspinwall (2005). The psychology of future-oriented thinking: From achievement to proactive coping, adaptation, and aging. *Motivation and Emotion, 29(4)*: 203-235.

Bandura (1976). Self-reinforcement: Theoretical and methodological considerations. *Behaviorism, 4(2)*: 135-155.

Brown (1991). Helping students confront and deal with stress and procrastination. *Journal of College Student Psychotherapy, 6*: 87-102.

Burka & Yuen (1983). *Procrastination: Why you do it, what to do about it*. Reading, MA: Addison-Wesley.

Cannings, Hawthorne, Hood, & Houston (2005). Putting double marking to the test: a framework to assess if it is worth the trouble. *Medical Education, 39(3):* 299-308.

Csikszentmihalyi (1990). *Flow: The psychology of optimal experience*. New York: Harper & Row.

Diefendorff, Richard, & Gosserand (2006). Examination of situational and attitudinal moderators of the hesitation and performance relation. *Personnel Psychology, 59*: 365-393.

Eisenberger (1992). Learned industriousness. *Psychological Review, 99*: 248-267.

Ellis & Knauss (1977). *Overcoming procrastination*. New York: Signet Books.

Febbraro & Clum (1998). Meta-analytic investigation of the effectiveness of self-regulatory components in the treatment of adult problem behaviors. *Clinical Psychology Review, 18(2)*: 143-161.

Feldman & Matjasko (2005). The role of school-based extracurricular activities in adolescent development: A comprehensive review and future directions. *Review of Educational Research, 75(2)*, 159-210.

Ferrari (1992). Psychometric validation of two procrastination inventoriesfor adults: Arousal and avoidance measures. *Journal of Psychopathology and Behavioral Assessment, 14(2):* 97–110.

Ferrari & Emmons (1995). Methods of procrastination and their relation to self-control and self-reinforcement: An exploratory study. *Journal of Social Behavior & Personality, 10(1)*: 135-142.

Furnham (2002). *Personality at work: The role of individual differences in the workplace*. New York: Routledge.

Gollwitzer (1996). The volitional benefits from planning. In Gollwitzer & Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 287-312). New York: Guilford Press.

Gropel & Steel (2008). A mega-trial investigation of goal setting, interest enhancement, and energy on procrastination. *Personality and Individual Differences, 45*: 406-411.

Hans (2000). A meta-analysis of the effects of adventure programming on locus of control. *Journal of Contemporary Psychotherapy, 30(1)*: 33-60.

Harris & Sutton (1983). Task procrastination in organizations: A framework for research. *Human Relations, 36*: 987-995.

Kavanagh, Andrade, & May (2005). Imaginary relish and exquisite torture: The elaborated intrusion theory of desire. *Psychological Review, 112(2)*, 446-467.

Klein (2009). *The secret pulse of time: Making sense of life's scarcest commodity*. Cambridge, MA: Da Capo Lifelong Books.

Levin & Spei (2004). Relationship of purported measures of pathological and nonpathological dissociation to self-reported psychological distress and fantasy immersion. *Assessment, 11(2)*: 160-168.

Lindsley, Brass, & Thomas (1995). Efficacy-performance spirals: A multilevel perspective. *Academy of Management Review, 20(3)*: 645-678.

Locke & Latham (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist, 57(9)*: 705-717.

Loewenstein & Elster (1992). The fall and rise of psychological explanations in the economics of intertemporal choice. In Loewenstein & Elster (Eds.), *Choice over time* (pp. 3-34). New York: Russell Sage Foundation.

McCown & Roberts (1994). A study of academic and work-related dysfunctioning relevant to the college version of an indirect measure of impulsive behavior. Integra Technical Paper 94-28, Radnor, PA: Integra, Inc.

Milgram, Sroloff, & Rosenbaum (1988). The procrastination of everyday life. *Journal of Research in Personality, 22*: 197-212.

Miller & Brickman (2004). A model of future-oriented motivation and self-regulation. *Educational Psychology Review, 16(1)*: 9-33.

Newstead (2002). Examining the examiners: Why are we so bad at assessing students? *Psychology Learning and Teaching, 2(2):* 70-75.

Oaten & Cheng (2006). Longitudinal gains in self-regulation from regular physical exercise. *British Journal of Health Psychology, 11(4)*: 713-733.

Oettingen, Mayer, Thorpe, Janatzke, & Lorenz (2005). Turning fantasies about positive and negative futures into self-improvement goals. *Motivation and Emotion, 29(4)*: 236-266.

Oettingen & Thorpe (2006). Fantasy realization and the bridging of time. In Sanna & Chang (Eds.), *Judgments over time: The interplay of thoughts, feelings, and behaviors* (pp. 120-143). Oxford: Oxford University Press.

Pham & Taylor (1999). From thought to action: Effects of process- versus outcome-based mental simulations on performance. *Personality and Social Psychology Bulletin, 25*: 250-260.

Renninger (2000). Individual interest and its implications for understanding intrinsic motivation. In Sansone & Harackiewicz (Eds.), *Inntrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 373-404). San Diego, CA: Academic Press.

Rhue & Lynn (1987). Fantasy proneness: The ability to hallucinate "as real as real." *British Journal of Experimental and Clinical Hypnosis, 4*: 173-180.

Rivis & Sheeran (2003). Descriptive norms as an additional predictor in the theory of planned behaviour: A meta-analysis. *Current Psychology, 22(3)*, 218-233.

Schelling (1992). Self-command: A new discipline. In Loewenstein & Elster (Eds.), *Choice over time* (pp. 167-176). New York: Russell Sage Foundation.

Schneider (2001). In search of realistic optimism: Meaning, knowledge, and warm fuzziness. *American Psychologist, 56(3)*: 250-263.

Schraw & Lehman (2001). Situational interest: A review of the literature and directions for future research. *Educational Psychology Review, 13(1)*: 23-52.

Schwartz (1989). *Psychology of learning and behavior* (3rd ed.). New York: Norton.

Sigall, Kruglanski, & Fyock (2000). Wishful thinking and procrastination. *Journal of Social Behavior & Personality, 15(5)*: 283-296.

Silver (1974). Procrastination. *Centerpoint, 1(1)*: 49-54.

Steel (2007). The nature of procrastination. *Psychological Bulletin, 133(1)*: 65-94.

Steel (2010a). *The Procrastination Equation*. New York: Harper.

Steel (2010b). Arousal, avoidant and decisional procrastinators: Do they exist? *Personality and Individual Differences, 48*: 926-934.

Steel & Konig (2006). Integrating theories of motivation. *Academy of Management Review, 31(4)*: 889-913.

Trope & Liberman (2003). Temporal construal. *Psychological Review, 110*: 403-421.

van Knippenberg, van Nippenberg, De Cremer, & Hegg (2004). Leadership, self, and identity: A review and research agenda. *The Leadership Quarterly, 15(6)*, 825-856.

Waldo & Merritt (2000). Fantasy proneness, dissociation, and DSM-IV axis II symptomatology. *Journal of Abnormal Psychology, 109(3)*: 555-558.

Weber (2003). Perception matters: Psychophysics for economists. In Brocas & Carrillo (Eds.), *The Psychology of Economic Decisions (Vol. II)*. New York: Oxford University Press.

Wolters (2003). [Understanding procrastination from a self-regulated learning perspective](). *Journal of Educational Psychology, 95(1)*: 179-187.

World Organization of the Scout Movement (1998). *Scouting: An educational system*. Geneva, Switzerland: World Scout Bureau.

Zimmerman (2002). [Becoming a self-regulated learner: An overview](). *Theory into Practice, 41(2)*: 64-70.

My Algorithm for Beating Procrastination

Part of the sequence: The Science of Winning at Life

After three months of practice, I now use a single algorithm to beat procrastination most of the times I face it.[1] It probably won't work for you quite like it did for me, but it's the best advice on motivation I've got, and it's a major reason I'm known for having the "gets shit done" property. There are reasons to hope that we can eventually break the chain of akrasia; maybe this post is one baby step in the right direction.

How to Beat Procrastination explained our best current general *theory* of procrastination, called "temporal motivation theory" (TMT). As an exercise in practical advice backed by deep theories, *this* post explains the *process* I use to beat procrastination — a process implied by TMT.

As a reminder, here's a rough sketch of how motivation works according to TMT:

$$Motivation = \frac{Expectancy \times Value}{Impulsiveness \times Delay}$$

Or, as Piers Steel summarizes:

> Decrease the certainty or the size of a task's reward — its expectancy or its value — and you are unlikely to pursue its completion with any vigor. Increase the delay for the task's reward and our susceptibility to delay — impulsiveness — and motivation also dips.

Of course, my motivation system is more complex than that. P.J. Eby likens TMT (as a guide for beating procrastination) to the "fuel, air, ignition, and compression" plan for starting your car: it might be true, but a more useful theory would include details and mechanism.

That's a fair criticism. Just as an fMRI captures the "big picture" of brain function at low resolution, TMT captures the big picture of motivation. This big picture helps us see where we need to work at the gears-and-circuits level, so we can become the goal-directed consequentialists we'd *like* to be.

So, I'll share my four-step algorithm below, and tackle the gears-and-circuits level in later posts.

Step 1: Notice I'm procrastinating.

This part's easy. I know I *should* do the task, but I feel averse to doing it, or I just don't feel motivated enough to care. So I put it off, even though my prefrontal cortex keeps telling me I'll be better off if I do it *now*. When this happens, I proceed to step 2.

Step 2: Guess which unattacked part of the equation is causing me the most trouble.

Now I get to play detective. Which part of the equation is causing me trouble, here? Does the task have low value because it's boring or painful or too difficult, or because the reward isn't

that great? Do I doubt that completing the task will pay off? Would I have to wait a long time for my reward if I succeeded? Am I particularly impatient or impulsive, either now or in general? Which part of this problem do I need to attack?

Actually, I lied. *I* like to play *army sniper*. I stare down my [telescopic sight](#) at the terms in the equation and interrogate them. "Is it *you*, Delay? Huh, motherfucker? Is it *you*? I've shot you before; don't think I won't do it again!"

But not everyone was raised on violent videogames. *You* may prefer a different role-play.

Anyway, I try to figure out where the main problem is. Here are some of the signs I look for:

When I imagine myself doing the task, do I see myself bored and distracted instead of engaged and interested? Is the task uncomfortable, onerous, or painful? Am I nervous about the task, or afraid of what might happen if I undertake it? Has the task's payoff lost its value to me? Perhaps it never had much value to me in the first place? If my answer to any of these questions is "Yes," I'm probably facing the motivation problem of *low value*.

Do I think I'm likely to succeed at the task? Do I think it's within my capabilities? Do I think I'll actually *get* the reward if I *do* succeed? If my answer to any of these questions is "No," I'm probably facing the problem of *low expectancy*.

How much of the reward only comes after a significant delay, and how long is that delay? If most of the reward comes after a big delay, I'm probably the facing the problem of, you guessed it, *delay*.

Do I feel particularly impatient? Am I easily distracted by other tasks, even ones for which I also face problems of low value, low expectancy, or delay? If so, I'm probably facing the problem of *impulsiveness*.

If the task is low value and low expectancy, and the reward is delayed, I run my expected value calculation again. Am I sure I *should* do the task, after all? Maybe I should drop it or delegate it. If after re-evaluation I *still* think I should do the task, then I move to step 3.

Step 3: Try several methods for attacking that specific problem.

Once I've got a plausible suspect in my sights, I fire away with the most suitable ammo I've got for that problem. Here's a quick review of some techniques described in [How to Beat Procrastination](#):

For [attacking the problem of low value](#): Get into a state of flow, perhaps by gamifying the task. Ensure the task has meaning by connecting it to what you value intrinsically. Get more energy. Use reward and punishment. Focus on what you love, wherever possible.

For [attacking the problem of low expectancy](#): Give yourself a series of small, challenging but achieveable goals so that you get yourself into a "success spiral" and expect to succeed. Consume inspirational material. Surround yourself with others who are succeeding. Mentally contrast where you are now and where you want to be.

For [attacking the problem of delay](#): Decrease the reward's delay if possible. Break the task into smaller chunks so you can get rewards each step of the way.

For [attacking the problem of impulsiveness](#): Use precommitment. Set specific and meaningful goals and subgoal and sub-subgoals. Measure your behavior. Build useful habits.

Each of these skills must be learned and practiced first before you can use them. It took me only a few days to learn the mental habit of "mental contrasting," but I spent *weeks* practicing the skill of getting myself into *success spirals*. I've spent *months* trying various

methods for having more energy, but I can do a lot better than I'm doing now. I'm not very good at goal-setting yet.

Step 4: If I'm still procrastinating, return to step 2.

If I've found some successful techniques for attacking the term in the motivation equation I thought was causing me the most trouble, but I'm still procrastinating, I return to step 2 and begin my assault on *another* term in the equation.

When I first began using this algorithm, though, I usually didn't get that far. By the time I had learned mental contrasting or success spirals or whatever tool made the difference, the task was either complete or abandoned. This algorithm only begins to shine, I suspect, once you've come to some level of mastery on most of the subroutines it employs. Then you can quickly employ them and, if you're still procrastinating, immediately employ others, until your procrastination is beaten.

Personal examples

Let me give you some idea of what it looks like for me to use this algorithm:

Building the large 5×5-unit Ikea "Expedit" bookshelf is boring and repetitive, so I made a game of it. I pounded each wooden peg 4 or 5 times, alternating between these two counts no matter how quickly each peg went into its hole, waiting to see if the girl I was with would notice the pattern. She didn't, so after every 10th peg I gave her a kiss, waiting to see if she'd catch *that* pattern. She didn't, so I started kissing her after every 5th peg.[2] Apparently she thought I was just especially amorous that night.

Sometimes, being an executive director just ain't fun. I need to make lots of decisions with large but uncertain consequences — decisions that some people will love and others will hate. This is not as cozy as the quiet researcher's life to which I had been growing accustomed. In many cases, the task of coming to a decision on something is fraught with anxiety and fear, and I procrastinate. In these cases, I remind myself of how the decision is connected to what I care about. I also purposely stoke my passion for the organization's mission by playing epic world-saving music like "Butterflies and Hurricanes" by Muse: "Change everything you are... your number has been called... you've got to be the best, you've got to change the world... your time is now." Then I re-do my VoI and EV calculations again and I god damned *try*.

While researching How to Beat Procrastination, I hired a German tutor. I planned to apply to philosophy graduate schools, which meant I needed to speak Greek, Latin, French, or German, and German philosophy isn't *quite* as universally bad as the others (e.g. see Thomas Metzinger). But I procrastinated when studying, for my reward was *very* uncertain: would I actually go the route of philosophy grad school, and would my knowledge of German help? My reward was also extremely delayed, likely by several years. In the end, I did the expected value calculation more carefully than before, and concluded that I *shouldn't* keep trying to speak my Rs from my throat. It was the right call: I'm now pretty certain I'll never go to philosophy grad school.

Three times, I've started writing books. But each time, the rewards (appreciation, notoriety, money) were so delayed and uncertain that I gave up. Instead, I broke the books into chunks that I could publish as individual articles.[3] Thus, I received *some* reward (appreciation, growing notoriety) after every article, and had relatively high expectancy for this reward (since my goal was no longer so lofty as to be picked up by a major publisher). Breaking it into chunks also allowed me to focus on writing the pieces for which I had the most passion. Along the way, I used many techniques to boost my energy.

Conclusion

The key is to be *prepared* to conquer procrastination by practicing the necessary sub-skills *first*. [Build small skills in the right order](). You can't play Philip Glass if you haven't first learned how to play scales, how to work the pedals, how to play arpeggios and ostinatos (*[lots]()* of arpeggios and ostinatos), etc. And you can't beat procrastination if you don't have any ammo ready when you've caught the right causal factor in your sights.

The quest toward becoming a [goal-directed consequentialist]() is long and challenging, much like that of becoming a [truth-aiming rationalist](). But the rewards are great, and the journey has perks. Remember: [true agency]() is rare but powerful. As Michael Vassar says, "Evidence that people are crazy is evidence that things are easier than you think." Millions of projects fail not because they "can't be done" but because the first 5 people who tried them failed due to boring, pedestrian reasons like procrastination or the planning fallacy. People with just a *bit* more agency than normal — people like [Benjamin Franklin]() and [Tim Ferriss]() — have incredible power.

At the end of *[Reasons and Persons]()*, Derek Parfit notes that non-religious ethics is a young field, and thus we may entertain high hopes for what will be discovered and what is possible. But [scientific self-help]() is even younger. We have only just begun our inquiry into procrastination's causes and cures. We don't yet know what is possible. All we can do is [try](). If you have [something to protect](), [shut up and do the impossible](). Things [may not be so impossible as you once thought]().

Next post: [How to Be Happy]()

Previous post: [How to Beat Procrastination]()

[1] The main areas where I still usually succumb to procrastination are diet and exercise. Luckily, my metabolism is holding out pretty well so far.

[2] Or, it was *something* like this. I can't remember the exact game I played, now.

[3] My abandoned book *Scientific Self Help* turned into my ongoing blog post sequence [The Science of Winning at Life](). My abandoned book *[Ethics and Superintelligence]()* was broken into chunks that morphed into [Singularity FAQ](), [The Singularity and Machine Ethics](), and many posts from [No-Nonsense Metaethics]() and *[Facing the Singularity]()*. My abandoned book *Friendly AI: The Most Important Problem in the World* was broken into pieces that resulted in [Existential Risk]() and some posts of *[Facing the Singularity]()*.

How to Be Happy

One day a coworker said to me, "Luke! You're, like, the happiest person I know! How come you're so happy all the time?"

It was probably a rhetorical question, but I had a very long answer to give. See, I was *un*happy for most of my life,[1] and even considered suicide a few times. Then I spent two years studying the science of happiness. Now, happiness is my natural state. I can't remember the last time I felt unhappy for longer than 20 minutes.

That kind of change won't happen for everyone, or even most people (beware of other-optimizing), but it's worth a shot!

We all want to be happy, and happiness is useful for other things, too.[2] For example, happiness improves physical health,[3] improves creativity,[4] and even enables you to make better decisions.[5] (It's harder to be rational when you're unhappy.[6]) So, as part of a series on how to win at life with science and rationality, let's review **the science of happiness**.

The correlates of happiness

Earlier, I noted that there is an abundance of research on factors that correlate with *subjective well-being* (individuals' own assessments of their happiness and life satisfaction).

Factors that *don't correlate* much with happiness include:
age,[7] gender,[8] parenthood,[9] intelligence,[10] physical attractiveness,[11] and money[12] (as long as you're above the poverty line). Factors that *correlate moderately* with happiness include: health,[13] social activity,[14] and religiosity.[15] Factors that *correlate strongly* with happiness include: genetics,[16] love and relationship satisfaction,[17] and work satisfaction.[18]

But correlation is not enough. We want to know what *causes* happiness. And that is a trickier thing to measure. But we do know a *few* things.

Happiness, personality, and skills

Genes account for about 50% of the variance in happiness.[19] Even lottery winners and newly-made quadriplegics do not see as much of a change in happiness as you would expect.[20] Presumably, genes shape your happiness by shaping your personality, which is known to be quite heritable.[21]

So which personality traits tend to correlate most with happiness? Extroversion is among the best predictors of happiness,[22] as are conscientiousness, agreeableness, self-esteem, and optimism.[23]

What if you don't have those traits? The first thing to say is that you might be capable of them without knowing it. Introversion, for example, can be exacerbated by *a lack of social skills*. If you decide to learn and practice social skills, you might find that you are more extroverted than you thought! (That's what happened to me.) The same goes for conscientiousness, agreeableness, self-esteem, and optimism - these are only partly linked to personality. They are to some extent learnable skills, and learning these skills (or even "acting as if") can increase happiness.[24]

The second thing to say is that lacking some of these traits does not, of course, doom you to unhappiness.

Happiness is subjective and relative

Happiness is not determined by objective factors, but by how you *feel* about them.[25]

Happiness is also relative[26]: you'll probably be happier making $25,000/yr in Costa Rica (where your neighbors are making $13,000/yr) than you will be making $80,000/yr in Beverly Hills (where your neighbors are making $130,000/yr).

Happiness is relative in another sense, too: it is relative to your *expectations*.[27] We are quite poor at predicting the strength of our emotional reactions to future events. We overestimate the misery we will experience after a romantic breakup, failure to get a promotion, or even contracting an illness. We also overestimate the *pleasure* we will get from buying a nice car, getting a promotion, or moving to a lovely coastal city. So: lower your expectations about the pleasure you'll get from such expenditures.

Flow and mindfulness

You may have heard of the famous studies[28] showing that people are happiest when they are in a state of "flow." Flow is the state you're in when you are fully engaged in a task that is interesting, challenging, and intrinsically rewarding to you. This is the experience of "losing yourself in the moment" or, as sports players say, "being in the zone."

Finding flow has largely to do with performing tasks that match your skill level. When a task is far beyond your skill level, you will feel defeated. When a task is too easy, you'll be bored. Only when a task is challenging but achievable will you feel good about doing it. I'm reminded of the state troopers in *Super Troopers*, who devised strange games and challenges to make their boring jobs passable. Myrtle Young made her boring job at a potato chip factory more interesting and challenging by looking for potato chips that resembled celebrities, and pulling them off the conveyor belts for her collection.

If you're struggling with negative thoughts, achieving flow is probably the best medicine. Contrary to popular wisdom, forced positive thinking often makes things worse.[29] Trying to *not* think about Upsetting Thought X has the same effect as trying to not think about pink elephants: you can't help but think about pink elephants.

While being "lost in the moment" may provide some of your happiest moments, research has also shown that when you're not in flow, taking a step outside the moment and practicing "mindfulness" - that is, paying attention to your situation, your actions, and your feelings - can reduce chronic pain and depression[30], reduce stress and anxiety[31], and produce a wide range of other positive effects.[32]

How to be happier

Happiness, then, is an enormously complex thing. Worse, we must remember the difference between experienced happiness and remembered happiness. I can only scratch the surface of happiness research in this tiny post. In short, there is no simple fix for unhappiness; no straight path to bliss.

Moreover, happiness will be achieved differently for different people. A person suffering from depression due to chemical imbalance may get more help from a pill than from learning better social skills. A healthy, extroverted, agreeable, conscientious woman can still be unhappy if she is trapped in a bad marriage. Some people were raised by parents whose parenting style did not encourage the development of healthy self-esteem,[33] and they will need to devote significant energy to overcome this deficit. For some, the road to happiness is long. For others, it is short.

Below, I review a variety of methods for becoming happier. Some of them I discussed above; many, I did not.

These methods are ranked roughly in descending order of importance and effect, based on my own reading of the literature. You will need to think about who you are, what makes you happy, what makes you unhappy, and what you can achieve in order to determine which of the below methods should be attempted first. Also, engaging any of these methods may require that you first gain some mastery over procrastination.

Here, then, are some methods for becoming happier[34]:

1. If you suffer from serious illness, depression, anxiety, paranoia, schizophrenia, or other serious problems, *seek professional help first*. Here's how.
2. Even if you don't need professional help, you may benefit from some self-exploration and *initial guidance* from a reductionistic, naturalistic counselor like Tom Clark.
3. Develop the skills and habits associated with *extroversion*. First, get some decent clothes and learn how to wear them properly. If you're a guy, read these books. If you're a girl, ask your girlfriends or try these books. Next, learn basic social skills, including body language. If you're *really* introverted, practice on Chatroulette or Omegle first. Next, spend more time with other people, making small talk. Go to meetups and CouchSurfing group activities. Practice your skills until they become more natural, and you find yourself *enjoying* being in the company of others. Learn how to be funny and practice that, too.
4. Improve your *self-esteem* and *optimism*. This is tricky. First, too much self-esteem can lead to harmful narcissism.[35] Second, it's not clear that a rationalist can endorse several standard methods for improving one's self esteem (self-serving bias, basking in reflected glory, self-handicapping)[36] because they toy with self-deception and anti-epistemology. But there are a few safe ways to

increase your self-esteem and optimism. Make use of success spirals, vicarious victory, and mental contrasting, as described here.

5. Improve your *agreeableness*. In simpler terms, this basically means: increase your empathy. Unfortunately, little is currently known (scientifically) about how to increase one's empathy.[37] The usual advice about trying to see things from another's perspective, and thinking more about people less fortunate than oneself, will have to do for now. The organization Roots of Empathy may have some good advice, too.

6. Improve your *conscientiousness*. Conscientiousness involves a variety of tendencies: useful organization, strong work ethic, reliability, planning ahead, etc. Each of these individual skills can be learned. The techniques for overcoming procrastination are useful, here. Some people report that books like *Getting Things Done* have helped them become more organized and reliable.

7. Develop the *habit of gratitude*. Savor the good moments throughout each day.[38] Spend time thinking about happy memories.[39] And at the end of each day, write down 5 things you are grateful for: the roof over your head, your good fortune at being born in a wealthy country, the existence of *Less Wrong*, the taste of chocolate, the feel of orgasm... whatever. It sounds childish, but it works.[40]

8. Find your *purpose* and live it. One benefit of religion may be that it gives people a sense of meaning and purpose. Without a magical deity to give you purpose, though, you'll have to find out for yourself what drives you. It may take a while to find it though, and you may have to dip your hands and mind into many fields. But once you find a path that strongly motivates you and fulfills you, take it. (Of course, you might not find one purpose but many.) Having a strong sense of meaning and purpose has a wide range of positive effects.[41] The 'find a purpose' recommendation also offers an illustration of how methods may differ in importance for people. 'Find a purpose' is not always emphasized in happiness literature, but for my own brain chemistry I suspect that finding motivating purposes has made more difference in my life than anything else on this list.

9. Find a more *fulfilling job*. Few people do what they love for a living. Getting to that point can be difficult and complicated. You may find that doing 10 other things on this list *first* is needed for you to have a good chance at getting a more fulfilling job. To figure out which career might be full of tasks that you love to do, a RIASEC personality test might help. In the USA, O*NET can help you find jobs that are in-demand and fit your personality.

10. Improve your relationship with your *romantic partner*, or find a different one. As with finding a more fulfilling job, this one is complicated, but can have major impact. If you know your relationship isn't going anywhere, you may want to drop it so you can spend more time developing yourself, which will improve future relationships. If you're pretty serious about your partner, there are many things you can do to improve the relationship. Despite being touted widely, "active listening" doesn't predict relationship success.[42] Tested advice for improving the chances of relationship success and satisfaction include: (1) do novel and exciting things with your partner often[43], (2) say positive things to and about your partner at least 5 times more often than you say negative things[44], (3) spend each week writing about why your relationship is better than some others you know about[45], (4) qualify every criticism of your partner with a review of one or two of their positive qualities[46], and (5) stare into each other's eyes more often.[47]

11. *Go outside* and move your body. This will improve your attention and well-being.[48]

12. Spend more time in *flow*. Drop impossible tasks in favor of tasks that are at the outer limits of your skillset. Make easy and boring tasks more engaging by turning them into games or adding challenges for yourself.
13. *Practice mindfulness* regularly. When not in flow, step outside yourself and pay attention to how you are behaving, how your emotions are functioning, and how your current actions work toward your goals. [Meditation](#) may help.
14. *Avoid consumerism*. The things you own *do* come to own you, in a sense. Consumerism leads to unhappiness.[49] Unfortunately, you've probably been programmed from birth to see through the lens of consumerism. One way to start deprogramming is by watching [this documentary](#) about the deliberate invention of consumerism by [Edward Bernays](#). After that, you may want to sell or give away many of your possessions and, more importantly, drastically change your purchasing patterns.

Note that seeking happiness *as an end* might be counterproductive. Many people report that constantly checking to see if they are happy actually decreases their happiness - a report that fits with the research on "flow." It may be better to seek some of the above goals as ends, and happiness will be a side-effect.

Remember: Happiness will not come from reading articles on the internet. Happiness will come when you *do* the things research recommends.

Good luck!

Notes

[1] From a young age through my teenage years, I was known as the pessimist in my family. Of course, I would retort I was merely a *realist*. Making happiness work within me made me an optimist. These days I'm pessimistic about many things: For example I think there's about a 50/50 chance the human species will survive this century. But it's a kind of rationalistic, emotionally detached pessimism. It doesn't affect my mood.

[2] Lyubomirsky, King, & Diener (2005).

[3] Steptoe et al. (2005).

[4] Isen et al. (1987); Isen (2004); Fredrickson (1998).

[5] Isen (2002); Morris (1999).

[6] Beck (2008); Ellis (2001).

[7] Age and happiness are unrelated (Lykken 1999), age accounting for less than 1% of the variation in people's happiness (Inglehart 1990; Myers & Diener 1997).

[8] Despite being treated for depressive disorders twice as often as men (Nolen-Hoeksema 2002), women report just as high levels of well-being as men do (Myers 1992).

[9] Apparently, the joys and stresses of parenthood balance each other out, as people with and without children are equally happy (Argyle 2001).

[10] Both IQ and educational attainment appear to be unrelated to happiness (Diener et al. 2009; Ross & Van Willigen 1997).

[11] Good-looking people enjoy huge advantages, but do not report greater happiness than others (Diener et al. 1995).

[12] The correlation between income and happiness is surprisingly weak (Diener & Seligman 2004; Diener et al. 1993; Johnson & Krueger 2006). One problem may be that higher income contributes to greater materialism, which impedes happiness (Frey & Stutzer 2002; Kasser et al. 2004; Solberg et al. 2002; Kasser 2002; Van Boven 2005; Nickerson et al. 2003; Kahneman et al. 2006).

[13] Those with disabling health conditions are happier than you might think (Myers 1992; Riis et al. 2005; Argyle 1999).

[14] Those who are satisfied with their social life are moderately more happy than others (Diener & Seligman 2004; Myers 1999; Diener & Seligman 2002).

[15] Religiosity correlates with happiness (Abdel-Kahlek 2005; Myers 2008), though it may be religious attendance and not religious belief that matters (Chida et al. 2009).

[16] Past happiness is the best predictor of future happiness (Lucas & Diener 2008). Happiness is surprisingly unmoved by external factors (Lykken & Tellegen 1996), because genes accounts for about 50% of the variance in happiness (Lyubomirsky et al. 2005; Stubbe et al. 2005).

[17] Married people are happier than those who are single or divorced (Myers & Diener 1995; Diener et al. 2000), and marital satisfaction predicts happiness (Proulx et al. 2007).

[18] Unemployment makes people very unhappy (Argyle 2001), and job satisfaction is strongly correlated with happiness (Judge & Klinger 2008; Warr 1999).

[19] Lyubomirsky et al. (2005); Stubbe et al. (2005).

[20] Brickman et al. (1978).

[21] Weiss et al. (2008).

[22] Lucas & Diener (2008); Fleeson et al. (2002).

[23] Lucas (2008) and Lyubomirsky et al. (2006).

[24] On the learnability of extroversion, see Fleeson et al. (2002); Bouchard & Loehlin (2001); McNeil & Fleeson (2006). On the learnability of agreeableness, see Graziano & Tobin (2009). On the learnability of conscientiousness, see Roberts et al. (2009). On the learnability of self-esteem, see Barrett et al. (1999); Borras et al. (2009). On the learnability of optimism, see Lindsley et al. (1995); Hans (2000); Feldman & Matjasko (2005). On the learnability of character traits in general, see Peterson & Seligman (2004).

[25] Schwarz & Strack (1999).

[26] Argyle (1999); Hagerty (2000).

[27] Gilbert (2006), Hsee & Hastie (2005), Wilson & Gilbert (2005).

[28] Csikszentmihalyi (1990, 1998); Gardner, Csikszentmihalyi & Damon (2002); Nakamura & Csikszentmihalyi (2009).

[29] Wegner (1989).

[30] Kabat-Zinn (1982).

[31] Shapiro et al. (1998); Chang et al. (2004).

[32] Grossman et al. (2004).

[33] Felson (1989); Harter (1998); Furnham & Cheng (2000); Wissink et al. (2006).

[34] There are several disputed and uncertain methods I did not mention. One example is "expressive writing." Compare Lepore & Smyth (2002) and Spera et al. (1994) to Seery et al. (2008). Moreover, talking with a others about bad experiences may help, but maybe not: see Zech & Rimé (2005). Another disputed method is that of improving mood by thinking quicker and more varied thoughts: see Pronin & Jacobs (2008). I'm waiting for more research to come in on that one. The results of "affectionate writing" are mixed: see Floyd et al. (2009). The effects of household plants are also mixed: see Bringslimark et al. (2009). There remains debate on whether forced smiles and laughter improve happiness. Finally, see the review of literature in Helliwell (2011).

[35] Crocker & Park (2004); Bushman & Baumeister (1998); Bushman & Baumeister (2002).

[36] Self-serving bias is the tendency to attribute success to internal causes (oneself), but attribute failure to external causes. Basking in reflected glory is an attempt to enhance one's image by announcing and displaying association with a well-perceived group or individual. Self-handicapping is a way of saving face by sabotaging one's performance in order to provide an excuse for the failure.

[37] See, for example: Stepien & Baernstein (2006); de Vignemont & Singer (2006); Heln & Singer (2008).

[38] Bryant & Veroff (2007).

[39] Burton & King (2004).

[40] Emmons & McCullough (2003); Lyubomirsky et al. (2005); Peterson (2006).

[41] Park & Folkman (1997); Bauer et al. (2008); Lee et al. (2006); Reker et al. (1987); Ulmer et al. (1991); Langer & Rodin (1976).

[42] Gottman et al. (1998); Hahlweg et al. (1984); Jacobson et al. (1987).

[43] Aron et al. (2000); Aron et al. (2003).

[44] Gottman (1984).

[45] Buunk et al. (2001).

[46] Murray & Holmes (1999).

[47] Aron et al. (2000). As for how to find, attract, and keep a great romantic partner in the first place, well: that will have to wait for another article. And of course, perhaps you're not looking for a *long term* romantic relationship at all. That's another article, too.

[48] Berto (2005); Hartig et al. (2003); Kaplan (1993, 2001); Price (2008); Berman et al. (2008); Tennessen & Cimprich (1995).

[49] Frey & Stutzer (2002); Kasser et al. (2004); Solberg et al. (2002); Kasser (2002); Van Boven (2005); Nickerson et al. (2003); Kahneman et al. (2006).

References

Argyle (1999). Causes and correlates of happiness. In Kahneman, Diener, & Schwartz (Eds.), *Well-being: The foundations of hedonic psychology*. New York: Sage.

Argyle (2001). *The Psychology of Happiness* (2nd ed.). New York: Routledge.

Aron, Norman, Aron, McKenna, & Heyman (2000). Couples shared participation in novel and arousing activities and experienced relationship quality. *Journal of Personality and Social Psychology, 78*: 273-283.

Aron, Norman, Aron, & Lewandowski (2003). Shared participation in self- expanding activities: Positive effects on experienced marital quality. In Noller & Feeney (Eds.), *Marital interaction* (pp. 177-196). Cambridge University

Press.

Barrett, Webster, Wallis (1999). Adolescent self-esteem and cognitive skills training: a school-based intervention. *Journal of Child and Family Studies 8(2)*: 217-227.

Bauer, McAdams, & Pals (2008). Narrative identity and eudaimonic well-being. *Journal of Happiness Studies, 9*: 81-104.

Beck (2008). The evolution of the cognitive model of depression and its neurobiological correlates. *American Journal of Psychiatry, 165*: 969-977.

Berman, Jonides, & Kaplan (2008). The cognitive benefits of interacting with nature. *Psychological Science, 19*: 1207-1212.

Berto (2005). Exposure to restorative environments helps restore attentional capacity. *Journal of Environmental Psychology, 25*: 249-259.

Brickman, Coates, & Janoff-Bulman (1978). Lottery winners and accident victims: Is happiness relative? *Journal of Personality and Social Psychology, 36*: 917-927.

Bringslimark, Hartig, & Patil (2009). The psychological benefits of indoor plants: A critical review of the experimental literature. Journal of *Environmental Psychology, 29(4)*: 422-433.

Bryant & Veroff (2006). *Savoring: A new model of positive experience*. Mahwah, NJ: Erlbaum.

Borras, Boucherie, Mohr, Lecomte, Perroud, & Huguelet (2009). Increasing self-esteem: Efficacy for a group intervention for individuals with severe mental disorders. *European Psychiatry, 24*: 307-316.

Bouchard & Loehlin (2001). Genes, evolution, and personality. *Behavior Genetics, 31*: 243–273.

Burton & King (2004). The health benefits of writing about intensely positive experiences. *Journal of Research in Personality, 38*: 150-163.

Bushman & Baumeister (1998). Threatened egotism, narcissism, self-esteem, and direct and displaced aggression: Does self-love or self-hate lead to violence? *Journal of Personality and Social Psychology, 75(1)*: 219-229.

Bushman & Baumeister (2002). Does self-love or self-hate lead to violence? *Journal of Research in Personality, 36(6)*: 543-545.

Buunk, Oldersma, & de Dreu (2001). Enhancing satisfaction through downward comparison: The role of relational discontent and individual differences in social comparison orientation. *Journal of Experimental Social Psychology, 37*: 452-467.

Chang, Palesh, Caldwell, Glasgow, Abramson, Luskin, Gill, Burke, & Koopman (2004). The effects of a mindfulness-based stress reduction program on stress, mindfulness self-efficacy, and positive states of mind. *Stress and Health, 20(3)*: 141-147.

Chida, Steptoe, & Powell (2009). Religiosity/Spirituality and Mortality. *Psychotherapy and Psychosomatics*, 78(2): 81-90.

Crocker & Park (2004). The costly pursuit of self-esteem. *Psychological Bulletin, 130*: 392-414.

Csikszentmihalyi (1990). *Flow: The Psychology of Optimal Experience*. New York: Harper and Row.

Csikszentmihalyi (1998). *Finding Flow: The Psychology of Engagement With Everyday Life*. Basic Books.

Diener, Wolsic, & Fujita (1995). Physical attractiveness and subjective well-being. *Journal of Personality and Social Psychology*, 69: 120-129.

Diener, Gohm, Suh, & Oishi (2000). Similarity of the relations between marital status and subjective well-being across cultures. *Journal of Cross-Cultural Psychology*, 31: 419-436.

Diener & Seligman (2002). Very happy people. *Psychological Science*, 13: 80-83.

Diener & Seligman (2004). Beyond money: Toward an economy of well-being. *Psychological Science in the Public Interest*, 5(1): 1-31.

Diener, Kesebir, & Tov (2009). Happiness. In Leary & Hoyle (Eds.), *Handbook of Individual Differences in Social Behavior* (pp. 147-160). New York: Guilford.

Ellis (2001). *Overcoming destructive beliefs, feelings, and behaviors: New directions for Rational Emotive Behavior Therapy*. Amherst, NY: Prometheus Books.

Emmons & McCullough (2003). Counting blessings versus burdens: An experimental investigation of gratitude and subjective well-being in daily life. *Journal of Personality and Social Psychology, 84*: 377-389.

Feldman & Matjasko (2005). The role of school-based extracurricular activities in adolescent development: A comprehensive review and future directions. *Review of Educational Research, 75(2)*, 159-210.

Felson (1989). Parents and the reflected appraisal process: A longitudinal analysis. *Journal of Personality and Social Psychology, 56*: 965-971.

Fleeson, Malanos, & Achille (2002). An intraindividual process approach to the relationship between extraversion and positive affect: is acting extraverted as "good" as being extraverted? *Journal of Personality and Social Psychology, 83(6)*: 1409-1422.

Floyd, Hesse, & Pauley (2009). Writing affectionate letters reduces stress: replication and extension. Paper presented at the annual meeting of the NCA 95th annual convention, Chicago, IL, Nov. 11, 2009.

Fredrickson (1998). What good are positive emotions? *Review of General Psychology, 2*: 300-319.

Frey & Stutzer (2002). What can economists learn from happiness research? *Journal of Economic Literature*, 40: 402-435.

Furnham & Cheng (2000). Perceived parental behavior, self-esteem and happiness. *Social Psychiatry and Psychiatric Epidemiology, 35(10)*: 463-470.

Gardner, Csikszentmihalyi, & Damon (2002). *Good Business: Leadership, Flow, and the Making of Meaning*. Basic Books.

Gilbert (2006). *Stumbling on happiness*. New York: Knopf.

Gottman (1984). *Why marriages succeed or fail*. New York: Simon & Schuster.

Gottman, Coan, Carrere, & Swanson (1998). Predicting marital happiness and stability from newlywed interactions. *Journal of Marriage and the Family, 60*: 5-22.

Graziano & Tobin (2009). Agreeableness. In Leary & Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 46-61). New York: Guilford.

Grossman, Niemann, Schmidt, & Walach (2004). Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research, 57*: 35-43.

Hagerty (2000). Social comparisons of income in one's community: Evidence from national surveys of income and happiness. *Journal of Personality and Social Psychology, 78*: 746-771.

Hahlweg, Schindler, Revensdorf, & Brengelmann (1984). The Munich marital therapy study. In Hahlweg & Jacobson (Eds.), *Marital interaction: Analysis and modification* (pp. 3-26). New York: Guilford Press.

Hans (2000). A meta-analysis of the effects of adventure programming on locus of control. *Journal of Contemporary Psychotherapy, 30(1)*: 33-60.

Harter (1998). The development of self-representations. In Eisenberg (Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development*. New York: Wiley.

Hartig, Evans, Jamner, Davis, & Garling (2003). Tracking restoration in natural and urban field settings. *Journal of Environmental Psychology, 23*: 109-123.

Helliwell (2011). How can subjective well-being be improved?

Heln & Singer (2008). I feel how you feel but not always: the empathic brain and its modulation. *Current Opinion in Neurobiology, 18(2)*: 153-158.

Hsee & Hastie (2005). Decision and experience: Why don't we choose what makes us happy? *Trends in Cognitive Sciences, 10(1)*: 31-37.

Inglehart (1990). *Culture shift in advanced industrial society*. Princeton, NJ: Princeton University Press.

Isen (2002). A role for neuropsychology in understanding the facilitating influence of positive affect on social behavior and cognitive processes. In Snyder & Lopez (Eds.), *Handbook of positive psychology* (pp. 528-540). New York: Oxford University Press.

Isen (2004). Some perspectives on positive feelings and emotions: Positive affect facilitates thinking and problem solving. In Manstead, Frijda, & Fischer (Eds.), *Feelings and emotions: The Amsterdam symposium* (pp. 263-281). New York: Cambridge University Press.

Isen, Daubman, & Nowicki (1987). Positive affect facilitates creative problemsolving. *Journal of Personality and Social Psychology, 52*: 1122–1131.

Jacobson, Schmaling, & Holtzworth-Monroe (1987). Component analysis of behavioral marital therapy: 2-year follow-up and prediction of relapse. *Journal of Marital and Family Therapy, 13*: 187-195.

Johnson & Krueger (2006). "How money buys happiness: Genetic and environmental processes linking finances and life satisfaction." *Journal of Personality and Social Psychology*, 90: 680-691.

Judge & Klinger (2008). Job satisfaction: Subjective well-being at work. In Eid & Larsen (Eds.), *The science of subjective well-being* (pp. 393-413). New York: Guilford.

Kabat-Zinn (1982). An outpatient program in behavioral medicine for chronic pain patients based on the practice of mindfulness meditation: Theoretical considerations and preliminary results. *General Hospital Psychiatry, 4*: 33-47.

Kahneman, Krueger, Schkade, Schwarz, & Stone (2006). "Would you be happier if you were richer? A focusing illusion."*Science*, 312: 1908-1910.

Kaplan (1993). The role of nature in the context of the workplace. *Landscaping and Urban Planning, 26*: 193-201.

Kaplan (2001). The nature of the view from home: Psychological benefits. *Environment and Behavior, 33(4)*: 507-542.

Kasser (2002). *The high prices of materialism*. Cambridge, MA: MIT Press.

Kasser, Ryan, Couchman, & Sheldon (2004). Materialistic values: Their causes and consequences. In Kasser & Kanner (Eds.), *Psychology and consumer culture: The struggle for a good life in a materialistic world*. Washington DC: American Psychological Association.

Langer & Rodin (1976). The effects of choice and enhanced personal responsibility for the aged: A field experiment in an institutional setting. *Journal of Personality and Social Psychology, Vol 34(2)*: 191-198.

Lee, Cohen, Edgar, Laizner, & Gagnon (2006). Meaning-making intervention during breast or colorectal cancer treatment improves self-esteem, optimism, and self-efficacy. *Social Science & Medicine, 62(12)*: 3133-3145.

Lepore & Smyth, eds. (2002). *The writing cure: How expressive writing promotes health and emotional well-being*. Washington, DC: American Psychological Association.

Lindsley, Brass, & Thomas (1995). Efficacy-performance spirals: A multilevel perspective. *Academy of Management Review, 20(3)*: 645-678.

Lucas (2008). Personality and subjective well-being. In Eid & Larsen (Eds.), *The science of subjective well-being* (pp. 171-194). New York: Guilford.

Lucas & Diener (2008). Personality and subjective well-being. In John, Robins, & Pervin (Eds.), *Handbook of personality: Theory and research, 3rd ed.* (pp. 795-814). New York: Guilford.

Lyubomirsky, Sheldon, & Schkade (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology*, 9(2), 111-131.

Lyubomirsky, Tkach, & DiMatteo (2006). What are the differences between happiness and self-esteem? *Social Indicators Research, 78*: 363-404.

Lyubomirsky, King, & Diener (2005). The benefits of frequent positive affect: Does happiness lead to success? *Psychological Bulletin, 131*: 803-855.

Lykken & Tellegen (1996). Happiness is a stochastic phenomenon. *Psychological Science*, 7: 186-189.

Lykken (1999). *Happiness: The nature and nurture of joy and contentment*. New York: St. Martin's.

McNeil & Fleeson (2006). The causal effect of extraversion on positive affect and neuroticism on negative affect: Manipulating state extraversion and state neuroticism in an experimental approach. *Journal of Research in Personality, 40*: 529-550.

Morris (1999). The mood system. In Kahneman, Diener, & Schwatrz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 169-189). New York: Russell Sage Foundation.

Murray & Holmes (1999). The (mental) ties that bind: Cognitive structures that predict relationship resilience. *Journal of Personality and Social Psychology, 77*: 1228-1244.

Myers (1992). *The pursuit of happiness: Who is happy, and why*. New York: Morrow.

Myers (1999). Close relationships and quality of life. In Kahnemann, Diener, & Schwarz (Eds.), *Well-being: The foundations of hedonic psychology*. New York: Sage.

Myers & Diener (1995). Who is happy? *Psychological Science*, 6: 10-19.

Myers & Diener (1997). The pursuit of happiness. *Scientific American, Special Issue 7*: 40-43.

Nakamura & Csikszentmihalyi (2009). Flow theory and research. In Lopez & Snyder (Eds.), *Oxford handbook of positive psychology* (2nd ed., pp. 195-206). New York: Oxford.

Nickerson, Schwartz, Diener, & Kahnemann (2003). Zeroing in on the dark side of the American dream: A closer look at the negative consequences of the goal for financial success. *Psychological Science*, 14(6): 531-536.

Park & Folkman (1997). Meaning in the context of stress and coping. *Review of General Psychology, 1*: 115-144.

Peterson (2006). *A primer on positive psychology*. New York: Oxford University Press.

Peterson & Seligman (2004). *Character strengths and virtues: A Handbook of classification*. New York: Oxford University Press.

Price (2008). Research roundup: Get out of town. *gradPSYCH, 6(3)*: 10.

Pronin & Jacobs (2008). Thought speed, mood, and the experience of mental motion. *Perspectives on Psychological Science, 3*: 461-485.

Proulx, Helms, & Cheryl (2007). Marital quality and personal well-being: A meta-analysis. *Journal of Marriage and Family*, 69: 576-593.

Reker, Peacock, & Wong (1987). Meaning and purpose in life and well-being: a life-span perspective. *The Journal of Gerontology, 42(1)*: 44-49.

Riis, Loewenstein, Baron, Jepson, Fagerlin, & Ubel (2005). Ignorance of hedonic adaptation to hemodialysis: A study using ecological momentary assessment. *Journal of Experimental Psychology: General*, 134: 3-9.

Roberts, Jackson, Fayard, Edmonds, & Meints (2009). Conscientiousness. In Leary & Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 369-381). New York: Guilford.

Ross & Van Willigen (1997). Education and the subjective quality of life. *Journal of Health & Social Behavior*, 38: 275-297.

Schwartz & Strack (1999). Reports of subjective well-being: Judgmental processes and their methodological implications. In Kahneman, Diener, & Schwartz (Eds.), *Well-being: The foundations of hedonic psychology*. New York: Russell Sage Foundation.

Seery, Silver, Holman, Ence, & Chu (2008). Expressing thoughts and feelings following a collective trauma: Immediate responses to 9/11 predict negative outcomes in a national sample. *Journal of Consulting and Clinical Psychology, 76(4)*: 657-667.

Shapiro, Schwartz, & Bonner (1998). The effects of mindfulness-based stress reduction on medical and pre-medical students. *Journal of Behavioral Medicine, 21*: 581-599.

Solberg, Diener, Wirtz, Lucas, & Oishi (2002). Wanting, having, and satisfaction: Examining the role of desire discrepancies in satisfaction with income. *Journal of Personality and Social Psychology*, 83(3): 725-734.

Spera, Buhrfeind, & Pennebaker (1994). Expressive writing and coping with job loss. *Academy of Management Journal, 3*: 72-733.

Stepien & Baernstein (2006). Educating for empaty: a review. *Journal of General Internal Medicine, 21(5)*: 524-530.

Steptoe, Wardle, & Marmot (2005). Positive affect and health-related neuroendocrine, cardiovascular, and inflammatory processes. *Proceedings of the National Academy of Sciences of the United States of America, 102(18)*: 6508-6512.

Stubbe, Posthuma, Boomsa, & De Geus (2005). Heritability and life satisfaction in adults: A twin-family study. *Psychological Medicine*, 35: 1581-1588.

Tennessen & Cimprich (1995). Views to nature: Effects on attention. *Journal of Environmental Psychology, 15*: 77-85.

Ulmer, Range, & Smith (1991). Purpose in life: a moderator of recovery from bereavement. *Journal of Death and Dying, 23(4)*: 279-289.

Van Boven (2005). Experientialism, materialism, and the pursuit of happiness. *Review of General Psychology*, 9(2): 132-142.

de Vignemont & Singer (2006). The empathic brain: how, when, and why? *Trends in Cognitive Sciences, 10(10)*: 435-441.

Warr (1999). Well-being and the workplace. In Kahneman, Diener, & Schwartz (Eds.), *Well-being: The foundations of hedonic psychology*. New York: Sage.

Wegner (1989). *White bears and other unwanted thoughts: Suppression, obsession, and the psychology of mental control*. New York: Viking.

Weiss, Bates, & Luciano (2008). Happiness is a personal(ity) thing. *Psychology Science, 19*: 205-210.

Wilson & Gilbert (2005). Affective forecasting: Knowing what to want. *Current Directions in Psychological Science, 14*: 131-134.

Wissink, Dekovic, & Meijer (2006). Parenting behavior, quality of the parent-adolescent relationship, and adolescent functioning in four ethnic groups. *Journal of Early Adolescence, 26*: 133-159.

Zech & Rimé (2005). Is talking about an emotional experience helpful? Effects on emotional recovery and perceived benefits. *Clinical Psychology and Psychotehrapy, 12*: 270-287.

The Good News of Situationist Psychology

In 1961, Stanley Milgram began his famous [obedience experiments](#). He found that ordinary people would deliver (what they believed to be) excruciatingly painful electric shocks to another person if instructed to do so by an authority figure. Milgram claimed these results showed that in certain cases, people are more heavily influenced by their *situation* than by their internal character.

Fifty years and hundreds of studies later, this kind of *situationism* is widely accepted for broad domains of human action. People can inflict incredible cruelties upon each other in a prison simulation.[b] Hurried passersby step over a stricken person in their path, while unhurried passersby stop to help.[a] Willingness to help varies with the [number of bystanders](#), and with proximity to a fragrant bakery or cofee shop.[c] The list goes on and on.[d]

Our inability to realize how powerful the effect *situation* has on human action is so well-known that it has a name. Our tendency to over-value trait-based explanations of others' behavior and under-value *situation*-based explanations of their behavior is called the [fundamental attribution error](#) (aka [correspondence bias](#)).

Recently, some have worried that this understanding undermines the traditional picture we have of ourselves as stable persons with robust characteristics. How can we trust others if their unpredictable situation may have so powerful an effect that it overwhelms the effect of their virtuous character traits?

But as I see it, situationist psychology is *wonderful news*, for it means we can change!

If situation has a powerful effect on behavior, then we have significant powers to improve our own behavior. It would be much worse to discover that our behavior was almost entirely determined by traits we were born with and cannot control.

For example, drug addicts can be more successful in beating addiction if they change their peer group - if they stop spending recreational time with other addicts, and spend time with drug-free people instead, or in a treatment environment.[e]

Improving rationality

What about improving your rationality? Situationist psychology suggests it may be wise to surround yourself with fellow rationalists. Having now been a visiting fellow with the [Singularity Institute](#) for only two days, I can already tell that almost everyone I've met who is with the Singularity Institute or has been through its visiting fellows program is a level or two above me - not just in knowledge about Friendly AI and simulation arguments and so on, but in day-to-day rationality skills.

It's fascinating to take part in a conversation with *really* trained rationalists. It might go something like this:

Person One: "I suspect that *P*, though I know that cognitive bias *A* and *B* and *C* are probably influencing me here. However, I think that evidence *X* and *Y* offer fairly strong support for *P*."

Person Two: "But what about *Z*? This provides evidence against *P* because blah blah blah..."

Person One: "Huh. I hadn't thought that. Well, I'm going to downshift my probability that *P*."

Person Three: "But what about *W*? The way Schmidhuber argues is this: blah blah blah."

Person One: "No, that doesn't work because blah blah blah."

Person Three: "Hmmm. Well, I have a lot of confusion and uncertainty about that."

This kind of thing can go on for hours, and not just on abstract subjects like simulation arguments, but also on more personal issues like fears and dreams and dating.

I've had several of these many-hours-long group conversations already - people arguing vigorously, often 'trashing' others' views (with logic and evidence), but with everybody apparently willing to update their beliefs, nobody getting mad or hurt, and people even *making decisions to change something in their life* in response to a [Bayesian update](#) about something.

The community norms reinforce this behavior, and it has had an obvious effect. All these people have spent time living with at least two other rationalists for many months - most of them, for longer than that. I haven't done an experiment that allows causal inference, but... *community* seems to be working splendidly for improving rationality. And situationist psychology explains why.

Conclusion

Want to change your behavior, your self? In many cases, one of the most effective things you can do is to *change your situation*.

Live with rationalists. Stop hanging out with downward-spiral, drug-abusing friends. Move to another state or province or nation. Get a different job. Spend more time at the park, less time at home. Or less time at the park, and more at home. Consider what you want to achieve, and how a change of situation might help you do that. Then change your situation, and change yourself.

Notes

[a] Darley & Batson (1973).

[b] Zimbardo et al. (1973).

[c] Baron (1997).

[d] Much of the literature is helpfully reviewed in Doris (2005).

[e] Velasquez et al. (2001); Connors et al. (2004, ch. 6.); Galanter (2010).

References

Baron (1997). The sweet smell of... helping: Effects of pleasant ambient fragrance on prosocial behavior in shopping malls. P*ersonality and Social Psychology Bulletin, 23*: 498-503.

Connors, Donovan, & DiClemente (2004). *Substance abuse treatment and stages of change: Selecting and planning interventions*. Guilford.

Darley & Batson (1973). From Jerusalem to Jericho: a study of situational and dispositional variables in helping behavior. *Journal of Personality and Social Psychology, 27*: 100-108.

Doris (2005). *Lack of Character*. Cambridge University Press.

Galanter (2010). Network therapy. In Marc Galanter and Herbert Kleber (eds.), *Psychotherapy for the treatment of substance abuse* (pp. 249-276). American Psychiatric.

Velasquez, Maurer, Crouch, & DiClemente (2001). *Group Treatment for Substance Abuse: A Stages-of-Change Therapy Manual*. Guilford.

Zimbardo, Banks, Haney, & Jaffee (1973). The mind is a formidable jailer: a pirandellian prison. *New York Times Magazine, April 8, 1973*, pp. 38-60.

The Power of Reinforcement

Story 1:

On Skype with Eliezer, I said: "Eliezer, you've been unusually *pleasant* these past three weeks. I'm really happy to see that, and moreover, it increases my probability than an Eliezer-led FAI research team will *work*. What caused this change, do you think?"

Eliezer replied: "Well, three weeks ago I was working with Anna and Alicorn, and every time I said something nice they fed me an M&M."

Story 2:

I once witnessed a worker who *hated* keeping a work log because it was only used "against" him. His supervisor would call to say "Why did you spend so much time on *that*?" or "Why isn't *this* done yet?" but never "I saw you handled *X*, great job!" Not surprisingly, he often "forgot" to fill out his worklog.

Ever since I got everyone at the Singularity Institute to keep work logs, I've tried to avoid connections between "concerned" feedback and staff work logs, and instead take time to comment positively on things I see in those work logs.

Story 3:

Chatting with Eliezer, I said, "Eliezer, I get the sense that I've inadvertently caused you to be slightly averse to talking to me. Maybe because we disagree on so many things, or something?"

Eliezer's reply was: "No, it's much simpler. Our conversations usually run longer than our previously set deadline, so whenever I finish talking with you I feel drained and slightly cranky."

Now I finish our conversations on time.

Story 4:

A major Singularity Institute donor recently said to me: "By the way, I decided that every time I donate to the Singularity Institute, I'll set aside an additional 5% for myself to do fun things with, as a motivation to donate."

The power of reinforcement

It's amazing to me how consistently we fail to take advantage of the power of reinforcement.

Maybe it's because behaviorist techniques like reinforcement feel like they don't respect human agency enough. But if you aren't treating humans more like animals than *most* people are, then you're *modeling humans poorly.*

You are not an agenty homunculus "corrupted" by heuristics and biases. You just *are* heuristics and biases. And you respond to reinforcement, because most of your motivation systems still work like the motivation systems of other animals.

A quick reminder of what you learned in high school

- A *reinforcer* is anything that, when it occurs in conjunction with an act, increases the probability that the act will occur again.
- A *positive reinforcer* is something the subject wants, such as food, petting, or praise. *Positive reinforcement* occurs when a target behavior is followed by something the subject wants, and this increases the probability that the behavior will occur again.
- A *negative reinforcer* is something the subject wants to avoid, such as a blow, a frown, or an unpleasant sound. *Negative reinforcement* occurs when a target behavior is followed by some *relief* from something the subject *doesn't want*, and this increases the probability that the behavior will happen again.

What works

1. **Small reinforcers are fine**, as long as there is a strong correlation between the behavior and the reinforcer (Schneider 1973; Todorov et al. 1984). All else equal, a large reinforcer is more effective than a small one (Christopher 1988; Ludvig et al. 2007; Wolfe 1936), but the more you increase the reinforcer magnitude, the less benefit you get from the increase (Frisch & Dickinson 1990).
2. **The reinforcer should *immediately* follow the target behavior** (Escobar & Bruner 2007; Schlinger & Blakely 1994; Schneider 1990). Pryor (2007) notes that when the reward is food, small bits (like M&Ms) are best because they can be consumed *instantly* instead of being consumed over an extended period of time.
3. **Any *feature* of a behavior can be strengthened** (e.g., its intensity, frequency, rate, duration, persistence, its shape or form), so long as a reinforcer can be made contingent on *that particular feature* (Neuringer 2002).

Example applications

- If you want someone to call you, then when they *do* call, don't nag them about how they never call you. Instead, be engaging and positive.

- When trying to maintain order in a class, ignore unruly behavior and praise good behavior (Madsen et al. 1968; McNamara 1987).
- Reward originality to encourage creativity (Pryor et al. 1969; Chambers et al. 1977; Eisenberger & Armeli 1997; Eisenberger & Rhoades 2001).
- If you want students to *understand* the material, don't get excited when they guess the teacher's password but instead when they demonstrate a technical understanding.
- To help someone improve at dance or sport, ignore poor performance but reward good performance immediately, for example by shouting "Good!" (Buzas & Allyon 1981) The reason you should ignore poor performance if you say "No, you're doing it wrong!" you are inadvertently punishing the *effort*. A better response to a mistake would be to reinforce the effort: "Good effort! You're almost there! Try once more."
- Reward honesty to help people be more honest with you (Lanza et al 1982).
- Reward opinion-expressing to get people to express their opinions more often (Verplanck 1955).
- You may even be able to reinforce-away annoying *involuntary* behaviors, such as twitches (Laurenti-Lions et al. 1985) or vomiting (Wolf et al. 1965).
- Want a young infant to learn to speak more quickly? Reinforce their attempts at vocalization (Ramely & Finkelstein 1978).
- More training should occur via video games like DragonBox, because computer programs can easily provide *instant* reinforcement *many times a minute* for *very specific behaviors* (Fletcher-Flinn & Gravatt 1995).

For additional examples and studies, see *The Power of Reinforcement* (2004), *Don't Shoot the Dog* (2006), and *Learning and Behavior* (2008).

I close with **Story 5**, from Amy Sutherland:

> For a book I was writing about a school for exotic animal trainers, I started commuting from Maine to California, where I spent my days watching students do the seemingly impossible: teaching hyenas to pirouette on command, cougars to offer their paws for a nail clipping, and baboons to skateboard.
>
> I listened, rapt, as professional trainers explained how they taught dolphins to flip and elephants to paint. Eventually it hit me that the same techniques might work on that stubborn but lovable species, the American husband.
>
> The central lesson I learned from exotic animal trainers is that I should reward behavior I like and ignore behavior I don't. After all, you don't get a sea lion to balance a ball on the end of its nose by nagging. The same goes for the American husband.
>
> Back in Maine, I began thanking Scott if he threw one dirty shirt into the hamper. If he threw in two, I'd kiss him. Meanwhile, I would step over any soiled clothes on the floor without one sharp word, though I did sometimes kick them under the bed. But as he basked in my appreciation, the piles became smaller.
>
> I was using what trainers call "approximations," rewarding the small steps toward learning a whole new behavior...
>
> Once I started thinking this way, I couldn't stop. At the school in California, I'd be scribbling notes on how to walk an emu or have a wolf accept you as a pack

member, but I'd be thinking, "I can't wait to try this on Scott."

...After two years of exotic animal training, my marriage is far smoother, my husband much easier to love.

Next post: [Rational Romantic Relationships Part 1](#)

Previous post: [The Good News of Situationist Psychology](#)

My thanks to Erica Edelman for doing much of the research for this post.

Rational Romantic Relationships, Part 1: Relationship Styles and Attraction Basics

Part of the Sequence: The Science of Winning at Life. Co-authored with Minda Myers and Hugh Ristik. Also see: Polyhacking.

When things fell apart between me (Luke) and my first girlfriend, I decided *that* kind of relationship wasn't ideal for me.

I didn't like the jealous feelings that had arisen within me. I didn't like the desperate, codependent 'madness' that popular love songs celebrate. I had moral objections to the idea of owning somebody else's sexuality, and to the idea of somebody else owning *mine*. Some of my culture's scripts for what a man-woman relationship should look like didn't fit my own goals very well.

I needed to *design* romantic relationships that made sense (decision-theoretically) for me, rather than simply *falling* into whatever relationship model my culture happened to offer. (The ladies of Sex and the City weren't too good with decision theory, but they certainly invested time figuring out which relationship styles worked for *them*.) For a while, this new approach led me into a series of short-lived flings. After that, I chose 4 months of contented celibacy. After that, polyamory. After that...

Anyway, the results have been wonderful. Rationality and decision theory work for relationships, too!

We humans compartmentalize by default. Brains don't automatically enforce belief propagation, and aren't configured to do so. Cached thoughts and cached selves can remain even after one has applied the lessons of the core sequences to particular parts of one's life. That's why it helps to *explicitly* examine what happens when you apply rationality to new areas of your life — from disease to goodness to morality. Today, we apply rationality to *relationships*.

Relationships Styles

When Minda had her first relationship with a woman, she found that the cultural scripts for heterosexual relationships didn't work for a homosexual relationship style. For example, in heterosexual dating (in the USA) the man is expected to ask for the date, plan the date, and escalate sexual interaction. A woman expects that she will be pursued and not have to approach men, that on a date she should be passive and follow the man's lead, and that she shouldn't initiate sex herself.

In the queer community, Minda quickly found that if she passively waited for a woman to hit on her, she'd be waiting all night! When she met her first girlfriend, *Minda* had to ask for the date. Minda writes:

> On dates, I didn't know if I should pay for the date or hold the door or what I was supposed to do! Each interaction required thought and negotiation that hadn't been necessary before. And this was really kind of neat. We had the opportunity to

create a relationship that worked for us and represented us as unique and individual human beings. And when it came to sexual interactions, I found it easy to ask for and engage in exactly what I wanted. And I have since brought these practices into my relationships with men.

But you don't need to have an 'alternative' relationship in order to decide you want to set aside some cultural scripts and design a relationship style that works for you. You can choose relationship styles that work for you *now*.

With regard to which type(s) of romantic partner(s) you want, there are many possibilities.

No partners:

- *Asexuality*. Asexuals don't experience sexual attraction. They comprise perhaps 1% of the population,[1] and include notables like Paul Erdos, Morrissey, and Janeane Garofalo. There is a network (AVEN) for asexuality awareness and acceptance.
- *Celibacy*. Celibates feel sexual attraction, but abstain from sex. Some choose to abstain for medical, financial, psychological, or philosophical reasons. Others choose celibacy so they have more time to achieve other goals, as I (Luke) did for a time. Others are involuntarily celibate; perhaps they can't find or attract suitable mates. This problem can often be solved by learning and practicing social skills.

One partner:

- *Monogamy*. Having one sexual partner at a time is a standard cultural script, and may be over-used due to the status quo bias. Long-term monogamy should not be done on the pretense that attraction and arousal for one's partner won't fade. It will.[2] Still, there may be many people for whom monogamy is optimal.

Many partners:

- *Singlehood*. Singlehood can be a good way to get to know yourself and experience a variety of short-term partners. About 78% of college students have had at least one 'one-night stand', and most such encounters were preceded by alcohol or drug use.[3] Indeed, many young people today no longer go on 'dates' to get to know a potential partner. Instead, they meet each other at a social event, 'hook up', and *then* go on dates (if the hookup went well).[4]
- *Friendship* '*with benefits*'. Friends are often people you already enjoy and respect, and thus may also make excellent sexual partners. According to one study, 60% of undergraduates have been a 'friend with benefits' for someone at one time.[5]
- *Polyamory.*[6] In a polyamorous relationship, partners are clear about their freedom to pursue multiple partners. Couples communicate their boundaries and make agreements about what is and isn't allowed. Polyamory often requires partners to de-program jealousy. In my experience, polyamory is *much* more common in the rationality community than in the general population.

Hugh points out that your limbic system may not agree (at least initially) with your cognitive choice of a relationship style. Some women say they want a long-term relationship but date 'bad boys' who are unlikely to become long-term mates.

Someone may think they want polyamorous relationships but find it impossible to leave jealousy behind.[7]

The Science of Attraction

A key skillset required for having the relationships you want is that of *building and maintaining attraction in potential mates*.

Guys seeking girls may wonder: Why do girls say they want "nice guys" but date only "jerks"? Girls seeking rationalist guys are at an advantage because the gender ratio lies in their favor, but they still might wonder: What can I do to attract the *best* mates? Those seeking same-sex partners may wonder how attraction can differ from heterosexual norms.

How do you build and maintain attraction in others? A lot can be learned by trying different things and seeing what works. This is often better than polling people, because people's verbal reports about what attracts them don't always match their actual behavior.[8]

To get you started, the virtues of scholarship and empiricism will serve you well. Social psychology has a wealth of knowledge to offer on successful relationships.[9] For example, here are some things that, according to the latest research, will tend to make people more attracted to you:

- *Proximity* and *familiarity*. Study after study shows that we tend to like those who live near us, partly due to availability,[10] and partly because repeated exposure to almost *anything* increases liking.[11] A Taiwanese man once demonstrated the power of proximity and repeated exposure when he wrote over 700 letters to his girlfriend, urging her to marry him. She married the mail carrier.[12]
- *Similarity*. We tend to like people who are similar to us.[13] We like people with faces similar to our own.[14] We are even more likely to marry someone with a similar-sounding name.[15] Similarity makes attraction endure longer.[16] Also, similar people are more likely to react to events the same way, thus reducing the odds of conflict.[17]
- *Physical attractiveness*. Both men and women prefer good-looking mates.[18] Partly, this is because the halo effect: we automatically assume that more attractive people are also healthier, happier, more sensitive, more successful, and more socially skilled (but not necessarily more honest or compassionate).[19] Some of these assumptions are correct: Attractive and well-dressed people *are* more likely to impress employers and succeed occupationally.[20] But isn't beauty relative? Some standards of beauty vary from culture to culture, but many are universal.[21] Men generally prefer women who exhibit signs of youth and fertility.[22] Women generally prefer men who (1) display possession of abundant resources,[23] (2) display high social status,[24] (3) exhibit a 'manly' face (large jaw, thick eyebrows, visible beard stubble)[25] and physique,[26] and (4) are tall.[27] Both genders generally prefer (1) agreeableness, conscientiousness, and extraversion,[28] (2) 'average' and symmetrical faces with features that are neither unusually small or large,[29] (2) large smiles,[30] (3) pupil dilation,[31] and some other things (more on this later).

- *Liking others*. Liking someone makes them more attracted to you.[32]
- *Arousing others*. Whether aroused by fright, exercise, stand-up comedy, or erotica, we are more likely to be attracted to an attractive person when we are generally aroused than when we are not generally aroused.[33] As David Myers writes, "Adrenaline makes the heart grow fonder."[34] This may explain why rollercoasters and horror movies are such a popular date night choice.

But this barely scratches the surface of attraction science. In a later post, we'll examine how attraction works in more detail, and draw up a science-supported game plan for building attraction in others.

Attractiveness: Mean and Variance

Remember that increasing your *average* attractiveness (by appealing to more people) may not be an optimal strategy.

Marketers know that it's often better to sacrifice broad appeal in order for a product to have very *strong* appeal to a niche market. The Appunto doesn't appeal to most men, but it appeals strongly enough to *some* men that they are willing to pay the outrageous $200 price for it.

Similarly, you may have the best success in dating if you appeal *very strongly* to *some* people, even if this makes you less appealing to *most* people — that is, if you adopt a niche marketing strategy in the dating world.[35]

As long as you can *find* those few people who find you *very* attractive, it won't matter (for dating) that *most* people aren't attracted to you. And because one can switch between niche appeal and broad appeal using fashion and behavior, you can simply use clothing and behavior with mainstream appeal during the day (to have general appeal in professional environments) and use alternative clothing and behavior when you're socializing (to have *strong* appeal to a small subset of people whom you've sought out).

To visualize this point, consider two attraction strategies. Both strategies employ phenomena that are (almost) universally attractive, but the blue strategy aims to maximize the frequency of *somewhat* positive responses while the red strategy aims to maximize the frequency of *highly* positive responses. The red strategy (e.g. using mainstream fashion) increases one's *mean attractiveness*, while the blue strategy (e.g. using alternative fashion) increases one's *attractiveness variance*. Hugh Ristik offers the following chart:

This goth guy and I (Luke) can illustrate this phenomenon. I aim for mainstream appeal; he wears goth clothing when socializing. My mainstream look turns off almost no one, and is attractive to most women, but doesn't get that many *strong* reactions right away unless I employ *other* high-variance strategies.[36] In contrast, I would bet the goth guy's alternative look turns off many people and is less attractive to most women than *my* look is, but has a higher frequency of *extremely* positive reactions in women.

In one's professional life, it may be better to have broad appeal. But in dating, the *goal* is to find people who find you extremely attractive. The goth guy sacrifices his

mean attractiveness to increase his attractiveness variance (and thus the frequency of *very* positive responses), and this works well for him in the dating scene.

High-variance strategies like this are a good way to filter for people who are strongly attracted to you, and thus avoid wasting your time with potential mates who only feel lukewarm toward you.

Up next

In future posts we'll develop an action plan for using the science of attraction to create successful romantic relationships. We'll also explain how rationality helps with relationship maintenance[37] and relationship satisfaction.

Previous post: [The Power of Reinforcement](#)

Notes

[1] Bogaert (2004).

[2] About half of romantic relationships of all types end within a few years (Sprecher 1994; Kirkpatrick & Davis 1994; Hill et al 1976), and even relationships that last exhibit diminishing attraction and arousal (Aron et al. 2006; Kurdek 2005; Miller et al. 2007). Note that even if attraction and arousal fades, romantic love can exist in long-term closed monogamy and it is associated with relationship satisfaction (Acevedo & Aron, 2009).

[3] Paul et al. (2000); Grello et al. (2006).

[4] Bogle (2008).

[5] Bisson & Levine (2009).

[6] Two introductory books on the theory and practice of polyamory are: Easton & Hardy (2009) and Taormino (2008).

[7] See work on 'conditional mating strategies' aka 'strategic pluralism' (Gangestad & Simpson, 2000).

[8] Sprecher & Felmlee (2008); Eastwick & Finkel (2008). Likewise, there is a difference between what people publicly report as being the cause of a breakup, what they actually think caused a breakup, and what actually caused a breakup (Powell & Fine, 2009). Also see [Inferring Our Desires](#).

[9] For overviews of this research, see: Bradbury & Karney (2010); Miller & Perlman (2008); Vangelisti & Perlman (2006); Sprecher et al. (2008); Weiten et al. (2011), chs. 8-12. For a history of personal relationships research, see Perlman & Duck (2006).

[10] Goodfriend (2009).

[11] This is called the [mere exposure effect](#). See Le (2009); Moreland & Zajonc (1982); Nuttin (1987); Zajonc (1968, 2001); Moreland & Beach (1992). The limits of this effect are explored in Bornstein (1989, 1999); Swap (1977).

[12] Steinberg (1993).

[13] Zajonc (1998); Devine (1995); Rosenbaum (1986); Surra et al. (2006); Morry (2007, 2009); Peplau & Fingerhut (2007); Ledbetter et al. (2007); Montoya et al. (2008); Simpson & Harris (1994).

[14] DeBruine (2002, 2004); Bailenson et al. (2005).

[15] Jones et al. (2004).

[16] Byrne (1971); Ireland et al. (2011).

[17] Gonzaga (2009). For an overview of the research on self-disclosure, see Greene et al. (2006).

[18] Langlois et al. (2000); Walster et al. (1966); Feingold (1990); Woll (1986); Belot & Francesconi (2006); Finkel & Eastwick (2008); Neff (2009); Peretti & Abplanalp (2004); Buss et al. (2001); Fehr (2009); Lee et al. (2008); Reis et al. (1980). This is also true for homosexuals: Peplau & Spalding (2000). Even infants prefer attractive faces: Langlois et al. (1987); Langlois (1990); Slater et al. (1998). Note that women report that the physical attractiveness is less important to their mate preferences than it actually is: Sprecher (1989).

[19] Eagly et al. (1991); Feingold (1992a); Hatfield & Sprecher (1986); Smith et al. (1999); Dion et al. (1972).

[20] Cash & Janda (1984); Langlois et al. (2000); Solomon (1987).

[21] Cunningham et al. (1995); Cross & Cross (1971); Jackson (1992); Jones (1996); Thakerar & Iwawaki (1979).

[22] Men certainly prefer youth (Buss 1989a; Kenrick & Keefe 1992; Kenrick et al. 1996; Ben Hamida et al. 1998). Signs of fertility that men prefer include clear and smooth skin (Sugiyama 2005; Singh & Bronstad 1997; Fink & Neave 2005; Fink et al. 2008; Ford & Beach 1951; Symons 1995), facial femininity (Cunningham 2009; Gangestad & Scheyd 2005; Schaefer et al. 2006; Rhodes 2006), long legs (Fielding et al. 2008; Sorokowski & Pawlowski 2008; Bertamini & Bennett 2009; Swami et al. 2006), and a low waist-to-hip ratio (Singh 1993, 2000; Singh & Young 1995; Jasienska et al. 2004; Singh & Randall 2007; Connolly et al 2000; Furnham et al 1997; Franzoi & Herzog 1987; Grabe & Samson 2010). Even men blind from birth prefer a low waist-to-hip ratio (Karremans et al. 2010).

[23] Buss et al. (1990); Buss & Schmitt (1993); Khallad (2005); Gottschall et al. (2003); Gottschall et al. (2004); Kenrick et al. (1990); Gustavsson & Johnsson (2008); Wiederman (1993); Badahdah & Tiemann (2005); Marlowe (2004); Fisman et al. (2006); Asendorpf et al. (2010); Bokek-Cohen et al. (2007); Pettay et al. (2007); Goode (1996).

[24] Feingold (1990, 1992b).

[25] Cunningham (2009); Cunningham et al. (1990).

[26] Singh (1995); Martins et al. (2007).

[27] Lynn & Shurgot (1984); Ellis (1992); Gregor (1985); Kurzban & Weeden (2005); Swami & Furnham (2008). In contrast, men prefer women who are about 4.5 inches shorter than themselves: Gillis & Avis (1980).

[28] Figueredo et al. (2006).

[29] Langlois & Roggman (1990); Rhodes et al. (1999); Singh (1995); Thornhill & Gangestad (1994, 1999). We may have evolved to be attracted to symmetrical faces because they predict physical and mental health (Thornhill & Moller, 1997).

[30] Cunningham (2009).

[31] Cunningham (2009).

[32] This is called reciprocal liking. See Curtis & Miller (1986); Aron et al (2006); Berscheid & Walster (1978); Smith & Caprariello (2009); Backman & Secord (1959).

[33] Carducci et al. (1978); Dermer & Pszczynski (1978); White & Knight (1984); Dutton & Aron (1974).

[34] Myers (2010), p. 710.

[35] One example of a high-variance strategy for heterosexual men in the dating context is a bold opening line like "You look familiar. Have we had sex?" Most women will be turned off by such a line, but those who react positively are (by selection and/or by the confidence of the opening line) usually *very* attracted.

[36] In business, this is often said as "not everyone is your customer": 1, 2, 3.

[37] For discussions of relationship maintenance in general, see: Ballard-Reisch & Wiegel (1999); Dinda & Baxter (1987); Haas & Stafford (1998).

References

Acevedo & Aron (2009). Does a long-term relationship kill romantic love? *Review of General Psychology, 13*: 59-65.

Aron, Fisher, & Strong (2006). Romantic love. In Vangelisti & Perlman (eds.), *The Cambridge Handbook of Personal Relationships*. Cambridge University Press.

Asendorpf, Penke, & Back (2010). From dating to mating and relating: Predictors of initial and long-term outcomes of speed dating in a community sample. *European Journal of Personality*.

Backman & Secord (1959). The effect of perceived liking on interpersonal attraction. *Human Relations, 12*: 379-384.

Badahdah & Tiemann (2005). Mate selection criteria among Muslims living in America. *Evolution and Human Behavior, 26*: 432-440.

Bailenson, Iyengar, & Yee (2005). Facial identity capture and presidential candidate preference. Paper presented at the Annual Conference of the International Communication Association.

Ballard-Reisch & Wiegel (1999). Communication processes in marital commitment: An integrative approach. In Adams & Jones (eds.), *Handbook of interpersonal commitment and relationship stability* (pp. 407-424). Plenum.

Belot & Francesconi (2006). Can anyone be 'the one'? Evidence on mate selection from speed dating. Centre for Economic Policy Research.

Ben Hamida, Mineka, & Bailey (1998). Sex differences in perceived controllability of mate value: An evolutionary perspective. *Journal of Personality and Social Psychology, 75*: 953–966.

Berscheid & Walster (1978). *Interpersonal Attraction*. Addison-Wesley.

Bertamini & Bennett (2009). The effect of leg length on perceived attractiveness of simplified stimuli. *Journal of Social, Evolutionary, and Cultural Psychology, 3*: 233-250.

Bogaert (2004). Asexuality: Prevalence and associated factors in a national probability sample. *Journal of Sex Research, 41*: 279-287.

Bogle (2008). *Hooking Up: Sex, dating, and relationships on campus*. New York University Press.

Bokek-Cohen, Peres, & Kanazawa (2007). Rational choice and evolutionary psychology as explanations for mate selectivity. *Journal of Social, Evolutionary, and Cultural Psychology, 2*: 42-55.

Bornstein (1989). Exposure and affect: Overview and meta-analysis of research, 1968-1987. *Psychological Bulletin, 106*: 265-289.

Bornstein (1999). Source amnesia, misattribution, and the power of unconscious perceptions and memories. *Psychoanalytic Psychology, 16*: 155-178.

Bradbury & Karney (2010). *Intimate Relationships*. W.W. Norton & Company.

Buss (1989). Sex differences in human mate preferences: Evolutionary hypotheses testing in 37 cultures. *Behavioral and Brain Sciences, 12*: 1-49.

Buss & Schmitt (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review, 100*: 204-232.

Buss, Abbott, Angleitner, Asherian, Biaggio, et al. (1990). International preferences in selecting mates: A study of 37 cultures. *Journal of Cross-Cultural Psychology, 21*: 5-47.

Buss, Shackelford, Kirkpatrick, & Larsen (2001). A half century of mate preeferences: The cultural evolution of values. *Journal of Marriage and Family, 63*: 291-503.

Byrne (1971). *The Attraction Paradigm*. Academic Press.

Carducci, Cosby, & Ward (1978). Sexual arousal and interpersonal evaluations. *Journal of Experimental Social Psychology, 14*: 449-457.

Cash & Janda (1984). The eye of the beholder. *Psychology Today, November*: 46-52.

Connolly, Mealey, & Slaughter (2000). The development of waist-to-hip ratio preferences. *Perspectives in Human Biology, 5*: 19-29.

Cross & Cross (1971). Age, sex, race, and the perception of facial beauty. *Developmental Psychology, 5*: 433-439.

Cunningham, Roberts, Wu, Barbee, & Druen (1995). "Their ideas of beauty are, on the whole, the same as ours": Consistency and variability in the cross-cultural perception of female attractiveness. *Journal of Personality and Social Psychology, 68*: 261-279.

Cunningham (2009). Physical Attractiveness, Defining Characteristics. In Reis & Sprecher (eds.), *Encyclopedia of Human Relationships, Vol. 3* (pp. 1237-1242). Sage Reference.

Curtis & Miller (1986). Believing another likes or dislikes you: Behaviors making the beliefs come true. *Journal of Personality and Social Psychology, 51*: 284-290.

DeBruine (2002). Facial resemblance enhances trust. *Proceedings of the Royal Society of London, 269*: 1307-1312.

DeBruine (2004). Facial resemblance increases the attractiveness of same-sex faces more than other-sex faces. *Proceedings of the Royal Society of London B, 271*: 2085-2090.

Dermer & Pszczynski (1978). Effects of erotica upon men's loving and liking responses for women they love. *Journal of Personality and Social Psychology, 36*: 1302-1309.

Devine (1995). Prejudice and outgroup perception. In Teser (ed.), *Advanced Social Psychology.* McGraw-Hill.

Dinda & Baxter (1987). Strategies for maintaining and repairing marital relationships. *Journal of Social and Personal Relationships, 4*: 143-158.

Dion, Berscheid, & Walster (1972). What is beautiful is good. *Journal of Personality and Social Psychology, 24*: 285-290.

Dutton & Aron (1974). Some evidence for heightened sexual attraction under conditions of high anxiety. *Journal of Personality and Social Psychology, 30*: 510-517.

Eagly, Ashmore, Makhijani, & Kennedy (1991). What is beautiful is good, but...: A meta-analytic review of research on the physical attractiveness stereotype. *Psychological Bulletin, 110*: 109-128.

Easton & Hardy (2009). *The Ethical Slut: A Practical Guide to Polyamory, Open Relationships & Other Adventures, 2nd edition*. The Celestial Arts.

Eastwick & Finkel (2008). Sex differences in mate preferences revisited: Do people know what they initially desire in a romantic partner? Journal of Personality and Social Psychology, 94: 245-264.

Eldridge (2009). Conflict patterns. In Reis & Sprecher (eds.), *Encyclopedia of human relationships: Vol. 1* (pp. 307-310). Sage Reference.

Ellis (1992). The evolution of sexual attraction: Evaluative mechanisms in women. In Barkow, Cosmides, & Tooby (eds.), *The Adapted Mind: Evolutionary psychology and the generation of culture* (pp. 267-288). Oxford University Press.

Fehr (2009). Friendship formation and development. In Reis & Sprecher (eds.), *Encyclopedia of Human Relationships, Vol. 1* (pp. 706-10). Sage Reference.

Feingold (1990). Gender differences in effects of physical attractiveness on romantic attraction: A comparison across five research paradigms. *Journal of Personality and Social Psychology, 59*: 981-993.

Feingold (1992a). Good-looking people are not what we think. *Psychological Bulletin, 111*: 304-341.

Feingold (1992b). Gender differences in mate selection preferences: A test of the parental investment model. *Psychological Bulletin, 116*: 429-256.

Figueredo, Sefcek, & Jones (2006). The ideal romantic partner personality. *Personality and Individual Differences, 41*: 431-441.

Fielding, Scholling, Adab, Cheng, Lao et al. (2008). Are longer legs associated with enhanced fertility in Chinese women? *Evolution and Human Behavior, 29*: 434-443.

Fink & Neave (2005). The biology of facial beauty. *Internal Journal of Cosmetic Science, 27*: 317-325.

Fink, Matts, Klingenberg, Kuntze, Weege, & Grammar (2008). Visual attention to variation in female skin color distribution. *Journal of Cosmetic Dermatology, 7*: 155-161.

Finkel & Eastwick (2008). Speed-dating. *Current Directions in Psychological Science, 17*: 193-197.

Fisman, Iyengar, Kamenica, & Simonson (2006). Gender differences in mate selection: Evidence from a speed dating experiment. *The Quarterly Journal of Economics, 121*: 673-697.

Ford & Beach (1951). *Patterns of Sexual Behavior*. Harper & Row.

Franzoi & Herzog (1987). Judging personal attractiveness: What body aspects do we use? *Personality and Social Psychology Bulletin, 13*: 19-33.

Furnham, Tan, & McManus (1997). Waist-to-hip ratio and preferences for body shape: A replication and extension. *Personality and Individual Differences, 22*: 539-549.

Gangestad & Simpson (2000). The evolution of human mating: Trade-offs and strategic pluralism. Behavioral and Brain Sciences, 23: 573-644.

Gangestad & Scheyd (2005). The evolution of human physical attractiveness. *Annual Review of Anthropology, 34*: 523-548.

Gillis & Avis (1980).

Gonzaga (2009). Similarity in ongoing relationships. In Reis & Sprecher (eds.), *Encyclopedia of Human Relationships, Vol. 3* (pp. 1496-1499). Sage Reference.

Goode (1996). Gender and courtship entitlement: Responses to personal ads. *Sex Roles, 34*: 141-169.

Goodfriend (2009). Proximity and attraction. In Reis & Sprecher (eds.), *Encyclopedia of Human Relationships, Vol. 3* (pp. 1297-1299). Sage Reference.

Gottschall, Berkey, Cawson, Drown, Fleischner, et al. (2003). Patterns of characterization in folktales across geographic regions and levels of cultural complexity: Literature as a neglected source of quantitative data. *Human Nature, 14*: 365-382.

Gottschall, Martin, Quish, & Rea (2004). Sex differences in mate choice criteria are reflected in folktales from around the world and in historical European literature. *Evolution and Human Behavior, 25*: 102-112.

Grabe & Samson (2010). Sexual Cues Emanating From the Anchorette Chair: Implications for Perceived Professionalism, Fitness for Beat, and Memory for News. *Communication Research, December 14*.

Greene, Derlega, Mathews (2006). Self-disclosure in personal relationships. In Vangelisti & Perlman (eds.), *The Cambridge Handbook of Personal Relationships* (pp. 409-428). Cambridge University Press.

Gregor (1985). *Anxious Pleasures: The sexual lives of an Amazonian people*. University of Chicago Press.

Grello, Welsh, & Harper (2006). No strings attached: The nature of casual sex in college students. *Journal of Sex Research, 43*: 255-267.

Gustavsson & Johnsson (2008). Mixed support for sexual selection theories of mate preferences in the Swedish population. *Evolutionary Psychology, 6*: 454-470.

Haas & Stafford (1998). An initial examination of maintenance behaviors in gay and lesbian relationships. *Journal of Social and Personal Relationships, 15*: 846-855.

Hatfield & Sprecher (1986). *Mirror, mirror... The importance of looks in everyday life*. State University of New York Press.

Hill, Rubin, & Peplau (1976). Breakups before marriage: The end of 103 affairs. *Journal of Social Issues, 32*: 147-168.

Ireland, Slatcher, Eastwick, Scissors, Finkel, & Pennebaker (2011). Language style matching predicts relationship initiation and stability. Psychological Science, 22: 39-44.

Jackson (1992). Physical appearance and gender: Sociobiological and sociocultural perspectives. State University of New York Press.

Jasienska, Ziomkiewicz, Ellison, Lipson, & Thune (2004). Large breasts and narrow waists indicate high reproductive potential in women. *Proceedings of the Royal Society of London, B, 271*: 1213-1217.

Jones (1996). *Physical attractiveness and the theory of sexual selection*. University of Michigan Press.

Jones, Pelham, Carvallo, & Mirenberg (2004). How do I love thee? Let me count the Js: Implicit egotism and interpersonal attraction. *Journal of Personality and Social Psychology, 87*: 665-683.

Karremans, Frankenhuis, & Arons (2010). Blind men prefer a low waist-to-hip ratio. *Evolution and Human Behavior, 31*: 182-186.

Kenrick, Sadalla, Groth, & Trost (1990). Evolution, traits, and the stages of human courtship: Qualifying the parental investment model. *Journal of Personality, 58*: 97-116.

Kenrick, Keefe, Gabrielidis, & Cornelius (1996). Adolescents' age preferences for dating partners: Support for an evolutionary model of life-history strategies. *Child Development, 67*: 1499-1511.

Kenrick & Keefe (1992). Age preferences in mates reflect sex differences in reproductive strategies. *Behavioral and Brain Sciences, 15*: 75-133.

Khallad (2005). Mate selection in Jordan: Effects of sex, socio-economic status, and culture. *Journal of Social and Personal Relationships, 22*: 155-168.

Kirkpatrick & Davis (1994). Attachment style, gender, and relationship stability: A longitudinal analysis. *Journal of Personality and Social Psychology, 66*: 502-512.

Kurdek (2005). What do we know about gay and lesbian couples? *Current Directions in Psychological Science, 14*: 251-254.

Kurzban & Weeden (2005). HurryDate: Mate preferences in action. *Evolution and Human Behavior, 26*: 227-244.

Langlois & Roggman (1990). Attractive faces are only average. *Psychological Science, 1*: 115-121.

Langlois, Roggman, & Reiser-Danner (1990). Infants' differential social responses to attractive and unattractive faces. *Developmental Psychology, 26*: 153-159.

Langlois, Roggman, Casey, Ritter, Riser-Danner, & Jenkins (1987). Infant preferences for attractive faces: Rudiments of a stereotype? *Developmental Psychology, 23*: 363-369.

Langlois, Kalakanis, Rubenstein, Larson, Hallam, & Smoot (2000). Maxims or myths of beauty? A meta-analysis and theoretical review. *Psychological Bulletin, 126*: 390-423.

Le (2009). Familiarity principle of attraction. In Reis & Sprecher (eds.), *Encyclopedia of Human Relationships, Vol. 1* (pp. 596-597). Sage Reference.

Ledbetter, Griffin, & Sparks (2007). Forecasting 'friends forever': A longitudinal investigation of sustained closeness between friends. *Personal Relationships, 14*: 343-350.

Lee, Loewenstein, Ariely, Hong, & Young (2008). If I'm not hot, are you hot or not? Physical-attractiveness evaluations and dating preferences as a function of one's own attractiveness. *Psychological Science, 19*: 669-577.

Lynn & Shurgot (1984). Responses to lonely hearts advertisements: Effects of reported physical attractiveness, physique, and coloration. *Personal and Social Psychology Bulletin, 10*: 349-357.

Marlowe (2004). Mate preferences among Hadza hunter-gatherers. *Human Nature, 4*: 365-376.

Martins, Tiggermann, & Kirkbride (2007). Those speedos become them: The role of self-objectification in gay and heterosexual men's body image. *Personality and Social Psychology Bulletin, 33*: 634-647.

Miller & Perlman (2008). *Intimate Relationships, 5th edition*. McGraw-Hill.

Montoya, Horton, & Kirchner (2008). Is actual similarity necessary for attraction? A meta-analysis of actual and perceived similarity. Journal of Social and Personal Relationships, 25: 889-922.

Moreland & Beach (1992). Exposure effects in the classroom: The development of affinity among students. *Journal of Experimental Social Psychology, 28*: 255-276.

Moreland & Zajonc (1982). Exposure effects in person perception: Familiarity, similarity, and attraction. *Journal of Experimental Social Psychology, 18*: 395-415.

Morry (2007). The attraction-similarity hypothesis among cross-sex friends: Relationship satisfactions, perceived similarities, and self-serving perception. *Journal of Social and Personal Relationships, 24*: 117-138.

Morry (2009). Similarity principle in attraction. In Reis & Sprecher (eds.), *Encyclopedia of Human Relationships, Vol. 3* (pp. 1500-1504.

Myers (2010). *Psychology, 9th edition*. Worth Publishers.

Neff (2009). Physical attractiveness, role in relationships. In Reis & Sprecher (eds.), *Encyclopedia of Human Relationships, Vol. 3* (pp. 1242-1245). Sage Reference.

Nuttin (1987). Affective consequences of mere ownership: The name letter effect in twelve European languages. *European Journal of Social Psychology, 17*: 381-402.

Paul, Wenzel, & Harvey (2000). 'Hookups': Characteristics and correlates of college students' spontaneous and anonymous sexual experiences. *Journal of Sex Research, 37*: 76-88.

Peplau & Fingerhut (2007). The close relationships of lesbians and gay men. *Annual Review of Psychology, 58*: 405-424.

Peplau & Spalding (2000). The close relationships of lesbians, gay men, and bisexuals. In Hendrick & Hendrick (eds.), *Close relationships: A Sourcebook*. Sage.

Peretti & Abplanalp (2004). Chemistry in the college dating process: Structure and function. *Social Behavior and Personality, 32*: 147-154.

Perlman & Duck (2006). The seven seas of the study of personal relationships: From "the thousand islands" to interconnected waterways. In Vangelisti & Perlman (eds.), *The Cambridge Handbook of Personal Relationships* (pp. 11-34). Cambridge University Press.

Pettay, Helle, Jokela, & Lummaa (2007). Natural selection on female life-history traits in relation to socio-economic class in pre-industrial human populations. *Plos ONE, July*: 1-9.

Powell & Fine (2009). Dissolution of relationships, causes. In Reis & Sprecher (eds.), *Encyclopedia of Human Relationships: Vol. 1* (pp. 436-440). Sage Reference.

Reis, Nezlek, & Wheeler (1980). Physical attractiveness in social interaction. *Journal of Personality and Social Psychology, 38*: 604-617.

Rhodes, Sumich, & Byatt (1999). Are average facial configurations attractive only because of their symmetry? *Psychological Science, 10*: 52-58.

Rhodes (2006). The evolutionary psychology of facial beauty. *Annual Review of Psychology, 57*: 199-226.

Rosenbaum (1986). The repulsion hypothesis: On the nondevelopment of relationships. *Journal of Personality and Social Psychology, 51*: 1156-1166.

Schaefer, Fink, Grammar, Mitteroecker, Gunz, & Bookstein (2006). Female appearance: Facial and bodily attractiveness as shape. Psychology Science, 48: 187-205.

Simpson & Harris (1994). Interpersonal attraction. In Weber & Harvey (eds.), *Perspective on close relationships* (pp. 45-66). Allyn & Bacon.

Singh (1993). Adaptive significance of waist-to-hip ratio and female physical attractiveness. Journal of Personality and Social Psychology, 65: 293-307.

Singh (1995). Female health, attractiveness, and desirability for relationships: Role of breast asymmetry and waist-to-hip ratio. *Ethology and Sociobiology, 16*: 465-481.

Singh (2000). Waist-to-hip ratio: An indicator of female mate value. *International Research Center for Japanese Studies, International Symposium 16*: 79-99.

Singh & Bronstad (1997). Sex differences in the anatomical locations of human body scarification and tattooing as a function of pathogen prevalence. *Evolution and Human Behavior, 18*: 403-416.

Singh & Young (1995). Body weight, waist-to-hip ratio, breasts, and hips: Role in judgments of female attractiveness and desirability for relationships. *Ethology and Sociobiology, 16*: 483-507.

Singh & Randall (2007). Beauty is in the eye of the plastic surgeon: Waist-to-hip ratio (WHR) and women's attractiveness. *Personality and Individual Differences, 43*: 329-340.

Slater, Von der Schulenburg, Brown, Badenoch, Butterworth, Parsons, & Samuels (1998). Newborn infants prefer attractive faces. *Infant Behavior and Development, 21*: 345-354.

Smith & Caprariello (2009). Liking. In Reis & Sprecher (eds.), *Encyclopedia of Human Relationships, Vol. 2* (pp. 978-982). Sage Reference.

Smith, McIntosh, & Bazzini (1999). Are the beautiful good in Hollywood? An investigation of the beauty-and-goodness stereotype on film. *Basic and Applied Social Psychology, 21*: 69-80.

Solomon (1987). Standard issue. *Psychology Today, November*: 30-31.

Sorokowski & Pawlowski (2008). Adaptive preferences for leg length in a potential partner. *Evolution and Human Behavior, 29*: 86-91.

Sprecher (1989). The importance to males and females of physical attractiveness, earning potential, and expressiveness in initial attraction. *Sex Roles, 21*: 591-607.

Sprecher (1994). Two studies on the breakup of dating and relationships. *Personal Relationships, 1*: 199-222.

Sprecher, Wenzel, & Harvey, eds. (2008). *Handbook of Relationship Initiation*. Psychology Press.

Steinberg (1993). Astonishing love stories (from an earlier United Press International report). *Games, February*: 47.

Sugiyama (2005). Physical attractiveness in adaptationist perspective. In Buss (ed.), *The handbook of evolutionary psychology* (pp. 292-342). Wiley.

Surra, Gray, Boettcher, Cottle, & West (2006). From Courtship to Universal Properties: Research on Dating and Mate Selection, 1950 to 2003. In Vangelisti & Perlman (eds.), *Cambridge Handbook of Personal Relationships*. Cambridge University Press.

Swami, Einon, & Furnham (2006). The leg-to-body ratio as a human aesthetic criterion. *Body Image, 3*: 317-323.

Swami & Furnham (2008).

Swap (1977). Interpersonal Attraction and Repeated Exposure to Rewarders and Punishers. Personality and Social Psychology Bulletin, 3: 248–251.

Symons (1995). Beauty is in the adaptations of the beholder: The evolutionary psychology of human female sexual attractiveness. In Abramson & Pinkerton (eds.), *Sexual nature, sexual culture* (pp. 80-118). University of Chicago Press.

Taormino (2008). Opening Up: A Guide to Creating and Sustaining Open Relationships. Cleis Press.

Thakerar & Iwawaki (1979). Cross-cultural comparisons in interpersonal attraction of females toward males. *Journal of Social Psychology, 108*: 121-122.

Thornhill & Gangestad (1994). Human fluctuating asymmetry and sexual behavior. *Psychological Science, 5*: 292-302.

Thornhill & Gangestad (1999). The scent of symmetry: A human sex pheromone that signals fitness? *Evolution and Human Behavior, 20*: 175-201.

Thornhill & Moller (1997). The relative importance of size and asymmetry in sexual selection. *Behavioral Ecology, 9*: 546-551.

Vangelisti & Perlman (2006). *The Cambridge Handbook of Personal Relationships*. Cambridge University Press.

Walster, Aronson, Abrahams, & Rottman (1966). Importance of physical attractiveness in dating behavior. *Journal of Personality and Social Psychology, 4*: 508-516.

Weiten, Dunn, & Hammer (2011). *Psychology Applied to Modern Life: Adjustment in the 21st Century, 10th edition*. Wadsworth Publishing.

White & Knight (1984). Misattribution of arousal and attraction: Effects of salience of explanations for arousal. *Journal of Experimental Social Psychology, 20*: 55-64.

Wiederman (1993). Evolved gender differences in mate preferences: Evidence from personal advertisements. *Ethology and Sociobiology, 14*: 331-352.

Woll (1986). So many to choose from: Decision strategies in videodating. *Journal of Social and Personal Relationships, 3*: 43-52.

Zajonc (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology, 9*: 1-27.

Zajonc (1998). Emotions. In Gilbert, Fiske, & Lindzey (eds.), *Handbook of Social Psychology, 4th edition.* McGraw Hill.

Zajonc (2001). [Mere exposure: A gateway to the subliminal](). *Current Directions in Psychological Science, 10*: 224-228.