

Research on the intersection of emotions and finance

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Neuroeconomics

The brain is both the most researched and the least understood organ, yet everything we know, do and experience is a product of our brain. The shared interest of social and neural sciences in understanding human behavior has led to the emergence of the interdisciplinary field of neuroeconomics, the study of the biological foundations of economic behavior (Camerer, Loewenstein, & Prelec, 2005). The field combines research methods from neuroscience (e.g. neuroimaging, eye-tracking, etc.), experimental and behavioral economics, including its subfield, behavioral finance, and cognitive and social psychology. Among the theoretical and practical pursuits of neuroeconomic research is the attempt to identify and test the biological links between cognitive building blocks and economic behavior in order to predict behavior, measure drives and well-being, and design interventions that will lead to making better economic decisions and improving well-being (Camerer, et al., 2015). Without this research, we are limited to classical economic assumptions of human consistency and rationality that fail to explain internal contradictions and irrational behavior.

Risk, intertemporal choice, that is, decisions that involve tradeoffs between outcomes that occur at different points in time, self-regulation, social preferences, and strategic behavior are among the current topics of neuroeconomic research (Breiter, 2001; Camerer, et al., 2015; Konovalov & Krajbich, 2016). Functional MRI studies have already identified multiple neural mechanisms involved in valuation and decision-making. More complex studies of the interactions among neural mechanisms will shed additional light on the biologically complex patterns of decision making, including economic decision-making, self-regulation, and social preferences. For example, multiple brain activities that signal preferences for donating money or rejecting unfair offers are involved in the trade off between social rewards and economic self-interest.

The increasing complexity and therefore uncertainty and stress of life in the 21st century make research on decision-making under conditions of heightened uncertainty and risk of great significance. Risk is preferred to ambiguity. In addition to the uncertainty that is built into our physical and biological world, neuroeconomics takes into consideration the uncertainties of the social world, uncertainties that arise out of our limited ability to predict the behavior of others. While such uncertainty is a source of anxiety, both it and risk are important factors in value-based decisions. Gauging the risk of outcomes is often just as important as predicting how valuable they will be. Higher cognitive skills, for example, reduce loss aversion and risk sensitivity (Burks et al., 2009). Personality traits are powerful predictors of economic outcome when it comes to educational and occupational attainment and marital stability (Roberts et al, 2007).

In a stock market experiment, Nadler and others (2015) demonstrated the causal effects of testosterone, a chemical messenger especially influential in male physiology, on financial asset mispricing and resulting market bubbles. Such biological factors can exacerbate risky behavior, which could in turn impact multiple parties, even the whole marketplace when organized trading is involved. The authors suggest the need to consider hormonal influences on decision-making in professional settings and recommend "cool down" periods to interrupt exceptionally positive feedback cycles and a return to focusing on the fundamental valuation of assets.

Bach and Dolan (2012) investigated how uncertainty is encoded in the brain and how it influences behavior, determining that neural encoding of uncertainty is highly individualistic. Learning rate is a key variable that determines the capacity for dealing with changing circumstances (Behrens et al, 2007).

According to Rustichini (2008), higher cognitive skills affect the economic lives of individuals by enabling them to systematically change their preferences and choices in a way that favors economic success.

According to a research review by Konovalov and Krajbichthe (2016), neuroeconomics has contributed to our understanding of how the brain learns the value/utility of actions and options in its environment. Neurobiological data is now used to create models to predict people's choices that are the result of the output of a dynamic comparison process in our brains and to detect when individuals or groups are likely to exhibit economically problematic behavior.

While the effects of exercise or lack thereof on our bodies is generally well understood, until recently only an academic elite understood the impact of the brain activities that guide our behavior. New popular publications in neuroeconomics (Zweig, 2007; Cross, 2017) and behavioral economics (Ariely, 2017; Thaler, 2015) however, have brought the discussion of brain science into everyone's home.

Thanks to progress in neuroscience, the study of economics now benefits from understanding the brain activities involved in decision-making (Glimcher & Fehr, 2014; Phillips, Kim, & Lee, D., 2012). Understanding what generates individual differences can lead to a better understanding of the underlying processes of decision-making. While studies of the neural basis of personality traits continue to enrich our understanding of such differences, there is still little agreement on what the complete theory of human decision-making should be (Rustichini, 2009; Nadler et al., 2015).

Money, Mind and Body

Psychologists have begun to approach the question of money and its impact on brain activity and behavior by observing the biological and psychological processes triggered by money that shape experience and behavior. Theories of money as a biological motivator and as a cultural object provided the foundation for their research (Bijleveld, Aarts, & Henk, 2014). According to neuroeconomists (Zweig, 2007), "...a monetary loss or gain is not just a financial or psychological outcome, but a biological change that has profound physical effects on the brain and body." Financial losses are processed in the same areas of the brain that respond to mortal danger, while the neural activity of someone experiencing financial gains is indistinguishable from that of someone who is high on cocaine.

More recently, the American Psychological Association published *Stress in America: Paying With Our Health* in 2015, a report which found that regardless of the economic climate, money has consistently topped Americans' list of stressors, above work, family responsibilities and health. "Nearly three quarters (72 percent) of adults report feeling stressed about money at least some of the time" and "more than one-quarter of adults (26 percent) report feeling stressed about money most or all of the time". Adults in lower-income households were also found to be twice as likely as those in higher-income households to say they feel stress about money all or most of the time (36 percent vs. 18 percent). Additionally, the APA noted that the impact of stress over money appears to be worse among Millennials and Gen Xers as well as the parents of children under the age of 18. Women are also noted to have more difficulty coping with financial stress than men. Both financial insecurity and the resulting stress feed upon one another to create a downward spiral, with regard to both finances and health. Financial insecurity causes stress. Stress worsens health. Poor health adds to financial insecurity, which in turn causes more stress . . .

Report findings also show that Americans who say they have emotional support, someone they can talk to about financial stress, report lower stress levels than those without such support. However, finding support can be challenging. "One in five Americans (21 percent) say they have no one to rely on for emotional support. A similar percentage of Americans (18 percent) say money is a taboo subject in their

family and more than one-third (36 percent) say that talking about money makes them uncomfortable” (APA, 2015).

Money can also affect social relationships in both positive and negative ways. The underpinnings of some financial decisions are more complex than just a simple quest for gain; hope, pride and status are also involved. Money provides strong extrinsic motivation but can also negate other motivational factors and make individuals more self-centered. It may also hinder the ability to understand the thoughts, intentions, and emotions of others and thus complicate interpersonal relationships (Ridlinger, McBride, 2015). Erich Kirchler and Eva Hofmann (2006) stress that differences among family members with regard to spending habits, attitudes about debt, charitable giving and the like impact the dynamics and outcomes of spousal disagreements about expenditures and savings in the family.

Money can be a source of distress and financial disorder; it can also be a source of happiness when used appropriately or in a meaningful way to help others. Thus, the emergence of financial therapy is a natural outcome in the pursuit of helping people to deal with money-related issues.

Financial therapy

Financial therapy, a 21st Century development, combines financial and emotional literacy under one roof. Its focus is the evaluation and treatment of cognitive, emotional, behavioral, and economic aspects of financial health. (Brit, Klontz, & Archuleta, 2015) Financial behavior tends to be more emotional than rational for most people. Consequently, while professionals in the field focus on helping with personal financial planning, cash flow and debt management for example, they also counsel clients to manage their emotions and avoid interpersonal conflicts when presented with financial choices. Financial therapy integrates both personal and interpersonal aspects of financial well-being. Therapists group intrapersonal money scripts, or childhood beliefs about money, into four categories: money worship, money status, money vigilance and money avoidance (Lawson, Klontz, & Brit, 2015). Money worship is the belief that money and purchasing power determine happiness. The money status group encompasses people who equate self-worth with net-worth. They sacrifice self-actualization and happiness to consumerism. Their more conservative money vigilance counterparts are at the opposite extreme. They vigilantly control their spending, live frugally and avoid even those expenses that could make life more pleasant. Although the complete avoidance of talking about or dealing with financial issues is associated with heightened emotional distress followed by conflict, the final group rejects the very idea of money altogether. (Novak, Johnson, 2017).

Unrecognized, money scripts can lead to money disorders. Identification of dysfunctional money scripts and behaviors, including such money disorders as compulsive buying, hoarding, and workaholism (Canale, Archuleta, & Klontz, 2015), is a long process of self-awareness. But because discussing the problems we have with money is difficult for so many of us self-awareness can be difficult to achieve without a structured social situation or a prompt (such as *Money Habitudes*) to broach the subject.

Emotionally driven as we are, researchers recommend a balance between emotion and reason is needed to arrive at better financial decisions. Money, while it is often a major stressor, can also relieve stress when it is used correctly. Money *can* buy happiness, but only when spending matches a buyer’s personality (Matz, Gladstone & Stillwell, 2016). We can also infer that when spending mismatches one’s personality internal dissatisfaction and/or external conflict may result. Research shows that people often fail to predict what will make them happy and overestimate the affective outcomes of their consumption decisions (Wilson & Gilbert, 2005).

No two brains work the same. By focusing on individuals rather than groups, *Money Habitudes* provides an opportunity for self-discovery through communication by better understanding underlying spending habits and their effects. Personality matched spending may also help people avoid compulsive purchases, especially when discretionary spending is restricted, by encouraging the habit of self-reflection and an awareness of one's needs.

The desire to understand the effects of money and our financial decisions on our well-being unites neuroeconomics and financial therapy. The former seeks to design universal interventions that will lead to making better economic decisions and improving overall well-being; the latter seeks to treat individuals in order to achieve a greater degree of personal happiness through self-knowledge and self-control. As profound as money-related biological changes in the brain and body are, researchers stress that *expecting* both good and bad events is often more intense than *experiencing* them (Zweig, 2007). Happiness can be fleeting, but knowing oneself and practicing self-control can increase the likelihood of achieving it.

Bibliography

- American Psychological Association (2015). Stress in America: paying with our health. Retrieved from <http://www.apa.org/news/press/releases/stress/2014/stress-report.pdf>
- Ariely, D. & Kreisler, J. (2017). *Dollars and Sense: How We Misthink Money and How to Spend Smarter*. HarperCollins.
- Bach, D.R., Dolan, R.J. (2012). Knowing how much you don't know: a neural organization of uncertainty estimates. *Nature Reviews Neuroscience*. 13, 572-586.
- Behrens, Timothy E.J., Woolrich, Mark W., Walton, Mark E., & Rushworth, Matthew F.S. (2007). Learning the value of information in an uncertain world. *Nature Neuroscience*, 10(9), 1214-21.
- Bijleveld, E., Aarts, E., & Henk, A. (2014). *The Psychological Science of Money*.
- Breiter, Aharon, Kahneman, Dale, & Shizgal. (2001). Functional Imaging of Neural Responses to Expectancy and Experience of Monetary Gains and Losses. *Neuron*, 30(2), 619-639
- Brit, S., Klontz, T., & Archuleta, K., (2015). Financial Therapy: Establishing an Emerging Field. In T. Klontz, S. Britt, K. Archuleta Eds., *Financial Therapy Theory, Research, and Practice*. Cham: Springer International Publishing.
- Burks, S., Carpenter, J., Goette, L., & Rustichini, A. (2009). Cognitive skills affect economic preferences, strategic behavior, and job attachment. *Proceedings of the National Academy of Sciences of the United States of America*, 106(19), 7745-50.
- Camerer, C., Cohen, J., Fehr, E., Glimcher, P., & Laibson, D. (2015). Neuroeconomics. In J. Kagel and A. Roth, *The handbook of experimental economics*. Princeton University Press. Vol. 2.
- Camerer, C., Loewenstein, G., & Prelec, D. (2005). Neuroeconomics: How Neuroscience Can Inform Economics. *Journal of Economic Literature*, 43(1), 9-64.
- Canale, A., Archuleta, K., and Klontz, T. (2015). Money Disorders. In T. Klontz, S. Britt, K. Archuleta Eds., *Financial Therapy Theory, Research, and Practice*. Cham: Springer International Publishing.
- Cross, M. (2017). *The Emotional Life of Money: How Money Changes the way we think*.
- Glimcher, P., & Fehr, E. (2014). *Neuroeconomics: Decision making and the brain*. Second ed.

- Kirchler E. and Hofmann, E. (2006). Economic Decisions in Private Household. In M. Altman Editor, *Handbook of contemporary behavioral economics: Foundations and developments*. Armonk, N.Y.:M.E. Sharpe
- Klontz, B., Britt, S., & Archuleta, K. (2015). *Financial Therapy Theory, Research, and Practice*. Cham: Springer International Publishing.
- Konovalov, A., & Krajbich, I. (2016). Over a Decade of Neuroeconomics: What Have We Learned? *Organizational Research Methods*. May 4, 2016. Retrieved from <https://doi.org/10.1177/1094428116644502>
- Lawson, D., Klontz, T., & Brit, S. (2015). Money Scripts. In T. Klontz, S. Britt, K. Archuleta Eds., *Financial Therapy Theory, Research, and Practice*. Cham: Springer International Publishing.
- Matz, S. C., Gladstone, J. J., & Stillwell, D. (2016). Money Buys Happiness When Spending Fits Our Personality. *Psychological Science*. <https://doi.org/10.1177/0956797616635200>
- Nadler, Amos, Jiao, Peiran, Johnson, Cameron J., Alexander, Veronika, Zak, Paul J., Finance, & Rs: Gsbe Efme. (2017). The Bull of Wall Street: Experimental Analysis of Testosterone and Asset Trading. *Management Science*, Urn:issn:0025-1909.
- Novak, J. R., & Johnson, R. R. (2017). Associations between Financial Avoidance, Emotional Distress, and Relationship Conflict Frequency in Emerging Adults in College. *Journal of Financial Therapy*, 8 (2) 5. <https://doi.org/10.4148/1944-9771.1146>
- Phillips, P. E. M., Kim, J. J., & Lee, D. (2012). Neuroeconomics. *Frontiers in Behavioral Neuroscience*, 6, 15. <http://doi.org/10.3389/fnbeh.2012.00015>
- Ridinger, G., McBride, M. (2015). Money Affects Theory of Mind Differently by Gender. *PLoS ONE* 10(12): e0143973. <https://doi.org/10.1371/journal.pone.0143973>
- Roberts, B., Kuncel, N., Shiner, R., Caspi, A., & Goldberg, L. (2007). The Power of Personality: The Comparative Validity of Personality Traits, Socioeconomic Status, and Cognitive Ability for Predicting Important Life Outcomes. *Perspectives on Psychological Science*, 2(4), 313-345
- Thaler, R. (2015). *Misbehaving: The making of Behavioral economics* (First ed.).
- Wilson, T., & Gilbert, D. (2005). Affective Forecasting: Knowing What to Want. *Current Directions in Psychological Science*, 14(3), 131-134.
- Zweig, Jason. (2007). *Your money and your brain: how the new science of neuroeconomics can help make you rich*. Simon & Schuster.

About the author

Dr. Elena Garrison has lived and worked in Russia, Japan and the U.S. She holds a Bachelor's and a Master's degree in Accounting and Auditing from the Ural State University of Economics as well as both a Master's in Business Administration and a Doctorate in Educational Leadership from the University of Montana. She has taught business and economics at Chief Dull Knife College and Bitterroot College in Montana as well as at Komazawa University in Tokyo, Japan. Beginning in the fall of 2018 Dr. Garrison will teach business at South Puget Sound Community College in Olympia, Washington. Her research interests include state investment in human capital, ethics across curriculum, sustainable business practices, and behavioral economics.