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EDUCATION

B.A. in Economics, University of Chicago, 2002-2005
Ph.D. in Business Economics, University of Chicago, Booth School of Business, 2005-2010
Thesis Title: *Biological Basis of Sex Differences in Risk and Competitive Preferences and Other Essays*
Post-Doctoral Research Scientist in Rady School of Management, University of California San Diego, 2010-

PH.D. THESIS COMMITTEE

Prof. John List (chair) University of Chicago, Department of Economics 1126 E. 59 th St Chicago, IL 60637, U.S.A. 1 773 702 6576 jlist@uchicago.edu	Prof. Uri Gneezy University of California San Diego, Rady School of Management 9500 Gilman Dr MC 0553 La Jolla, CA 92093, U.S.A. 1 858 534 4312 ugneezy@ucsd.edu	Prof. Emir Kamenica University of Chicago, Booth School of Business 5807 S. Woodlawn Ave Chicago, IL 60637, U.S.A. 1 773 834 8690 emir.kamenica@ChicagoBooth.edu
Prof. Steven Levitt University of Chicago, Booth School of Business 5807 S. Woodlawn Ave Chicago, IL 60637, U.S.A. 1 773 834 1862 slevitt@uchicago.edu	Prof. Daniel Fessler University of California Los Angeles, Department of Anthropology 341 Haines Hall Los Angeles, CA 90095 U.S.A. 1 310 794 9252 dfessler@anthro.ucla.edu	Prof. Brian Rogers Northwestern, Kellogg School of Management 2001 Sheridan Road Evanston, IL 60208, U.S.A. 1 847 467 7068 b-rogers@kellogg.northwestern.edu

TEACHING AND RESEARCH FIELDS

Primary field: Applied Microeconomics
Secondary field(s): Experimental Economics, Behavioral Economics, Game Theory

TEACHING EXPERIENCE

- 2002-03 Lecturer, SAT Preparatory Class at Kenwood Academy under Elizabeth Kirby(High School); Teacher's Aid, algebra Akiba Schechter under Miriam Schiller (Middle School).
- 2003-04 Lecturer, SAT Preparatory Class at Kenwood Academy under Elizabeth Kirby(High School); Teacher's Aid, algebra Akiba Schechter under Miriam Schiller (Middle School); Teaching Assistant, Precalculus, Number Theory, and Calculus under Dianne Herrmann (undergraduate); Lecturer, Number Theory, Young Scholars Program, under Dinanne Hermann (middle school).
- 2004-05, Lecturer, SAT Preparatory Class at Kenwood Academy undre Elizabeth Kirby(High School); Teacher's Aid, algebra at Akiba Schechter under Miriam Schiller (Middle School); Teaching Assistant, Negotiation Strategies for Uri Gneezy(MBA); Lecturer, Number Theory for Dinanne HermannYoung Scholars Program (middle school).
- 2005-06, Teaching Assistant for Prof. Yuval Rottenstreich, Negotiation Strategies (MBA); Teaching Assistant for Prof. Uri Gneezy, Negotiation Strategies; Teaching Assistant for George Wu, Managerial Decision Making (MBA).
- 2009-10, Teaching Assistant for Prof. Saurabh Bhargava, Negotiation Strategies (MBA); Teaching Assistant for Prof. Laurens Debo, Operations Management (MBA); Teaching Assistant for Prof. Rodney Parker Operations Management (MBA)

RESEARCH EXPERIENCE AND EMPLOYMENT

- 2002-04 Office Manager for International Insurance
 2004-06 Research Assistant for Prof. U. Gneezy, University of Chicago

SCHOLARSHIPS, HONORS AND AWARDS

- 2003-05 VIGRE Fellowship, University of Chicago, Department of Mathematics
 2005-06 University of Chicago, Graduate School of Business Fellowship
 2006-07 Graduate School of Business Summer Paper Grant
 2009-10 Sanford J. Grossman in honor of Arnold Zellner Dissertation Fellowship

PROFESSIONAL ACTIVITIES

Referee for *Journal of Political Economy*, *Experimental Economics*, *Journal of Economic Behavior and Organizations*, *Evolution and Human Behavior*, *Management Science*.

Pre-Doctoral Fellow at Managerial Economics and Decision Sciences, Kellogg School of Management, Northwestern, 2008-09

Visiting Scholar at Rady School Of Mangement University of California San Diego Winter 2008

Visiting Scholar at Program for Evolutionary Dynamics, Harvard University Spring 2008.

Invited Seminar Speaker: Evolution and Human Behavior Conference 2009, 2010, Rady School of Management UCSD 2010, Animal Behavior Working Group, University of Chicago 2007, Experimental Economics 2007, Conference on Gender Differences in Competitiveness and Risk, Barcelona 2010, European School of Management and Technology 2010, The Evolution of Cooperation and Trading Conference 2010, Workshop on Biological Basis of Behavioral Economics 2010.

Publications

“Prices Matter in Ultimatum Games”

(Revise and Resubmit at American Economic Review. Joint with Steffan Anderson, Uri Gneezy, John List, and Seda Ertac)

One of the most robust findings in experimental economics is that many individuals in one-shot ultimatum games reject unfair offers, leaving themselves and their bargaining partner with a zero payoff. Puzzlingly, rejection rates are robust to substantial increases in stakes, leading players to forego significant sums of money. Such results have served as a stepping stone to motivate models of fairness and provide empirical ammunition for critics of standard game theoretic models. This study uses a new approach to measure stake effects in ultimatum games. By combining an experimental design that elicits a significant number of low offers with an environment that permits use of much larger stakes than in the literature, we are able to examine stake effects over ranges of data that are heretofore unexplored. Our main result is that proportionally equivalent offers are significantly less likely to be rejected with high stakes, even in one-shot play with inexperienced subjects. In fact, our paper is the first to present evidence that as stakes increase—to offers of 30-40 days of wages—rejection rates approach zero.

“Taboos and Identity: Considering the Unthinkable”

(Forthcoming at American Economic Journal: Microeconomics, joint with Chaim Fershtman and Uri Gneezy)

A taboo is an "unthinkable" action. Even the thought of violating a taboo triggers a punishment. We consider a simple model in which taboos are part of the definition of one's identity. Deliberating over breaking the taboo changes the individual's choice set and provides information on possible private benefits but is costly because it contradicts one's identity. The strength of the taboo is endogenously determined by the number of individuals that obey it. We analyze the relationship between social heterogeneity and the strength as well as effectiveness of taboos. We then examine societies in which individuals may choose among several identities characterized by different taboos. Having such a choice defines a dynamic process with respect to social identity: Some identities disappear while others flourish. We examine the characterization and the conditions giving rise to a multi-identity society.

“Testosterone and financial risk preferences.”

(Evolutionary Human Behavior, 29: 384–390, (2008), joint with Coren L. Apicella, Anna Dreber, Peter B. Gray, Peter, Anthony Little, and Benjamin C. Campbell)

Many human behaviors, from mating to food acquisition and aggressiveness, entail some degree of risk. Testosterone, a steroid hormone, has been implicated in a wide range of such behaviors in men. However, little is known about the specific relationship between testosterone and risk preferences. In this article, we explore the relationship between prenatal and pubertal testosterone exposure, current testosterone, and financial risk preferences in men. Using a sample of 98 men, we find that risk-taking in an investment game with potential for real monetary payoffs correlates positively with salivary testosterone levels and facial masculinity, with the latter being a proxy of pubertal hormone exposure. 2D:4D, which has been proposed as a proxy for prenatal hormone exposure, did not correlate significantly with risk preferences. Although this is a study of association, the results may shed light on biological determinants of risk preferences.

“Androgens and Competitiveness in Men”

(Forthcoming in Journal of Neuroscience Psychology and Economics, Joint with Coren Apicella, Anna Dreber, Peter B. Gray, Peter, Anthony Little, and Benjamin C. Campbell)

In this study, we investigate the association between a number of hormonal variables (circulating testosterone, facial masculinity, 2D:4D digit ratio, and cortisol) and competitiveness in a sample of 93 men aged 18-23. Competitiveness is measured by self-selection into a competitive setting versus a piece-rate scheme. We find no robust correlations between any of the hormonal variables and competitiveness,

though there are some suggestive patterns in the data which merit further exploration.

Working Papers

“Biological Basis of Sex Differences in Risk Aversion and Competitiveness”

(Invited to Journal of Economic Perspectives, joint with Anna Dreber)

In this review we present the evidence supporting the notion that there is a biological basis for sex differences in risk aversion and competitiveness, as well as discuss the contradictory evidence. We review the relevant literature in evolutionary theory, and animal behavior, endocrinology and neuroscience, as well as the literature relating human risk aversion and competitiveness to 2D:4D (a proxy of prenatal testosterone exposure), facial masculinity (a proxy of pubertal testosterone exposure), as well as circulating testosterone. While the results are thus far somewhat mixed, the evidence suggests that biological factors explain part of the sex gap in these economic preferences.

“2D:4D and Risk Aversion: Evidence that the Gender Gap in Preferences is Partly Biological.”

(Joint with Anna Dreber)

Males have been consistently found to take more risk than females (Croson and Gneezy 2004, Byrnes et al. 1999). This gender gap is economically significant because risk preferences determine significant labor market outcomes ranging from career choice to income (Barsky et al. 1997) and therefore may help explain the gender gap in earnings and occupations. This gender gap is biologically significant because it is a direct prediction of Trivers (1972) seminal theoretical paper arguing that the essential differences between males and females stem from differences in variance in reproductive success. Using a laboratory measure previously validated by economists (Gneezy and Potters 1997), we show that risk aversion positively correlates with 2D:4D – the ratio between the length of the 2nd (index) finger and the 4th (ring) finger. This is a biological measure that is thought to positively correlate with prenatal estrogen and negatively correlate with prenatal testosterone and is fixed early in life (Manning et al. 1998). Moreover, the gender coefficient drops when 2D:4D is added to the regression. Our findings are the first to indicate that the gender gap in risk aversion, and consequently labor market outcomes, cannot fully be explained by socialization or discrimination.

“Handedness and Competitiveness: Evidence that the Gender Gap in Competitive Preferences is Partly Biological.”

(Joint with Uri Gneezy)

Men are more competitive than women (Gneezy, Niederle, & Rustichini '03). And this is thought to explain part of the gender gap in occupations and incomes. Gneezy, Leonard, & List ('08) indicate partly cultural. In other animals, males are more competitive than females, and for good reason, since males have higher variance in reproductive success (Trivers '72). Suggesting that biology also plays a role. We show this using handedness. Handedness is a proxy for right hemispheric dominance (Levy & Reid '78), which is fixed before birth (Witelson, '89), is more frequent among men (Halpern '98), and correlates with standard gender differences like spatial skills (Lewis & Harris '90). We had 1136 villagers from North East India throw ten balls into a bucket and choose how to get paid--either 1/5th a day's wage per ball, or 3/5ths a day's wage per ball, if they got more balls than the last subject who did the task. Lefties were more likely to choose the competitive payment scheme and were more likely to be male.

Height and Competitiveness

(Joint with Daniel Fessler, Uri Gneezy, and John List)

Taller people are, on average, more successful in labor markets. For example, the tallest quartile earns 13 percent more than the shortest quartile (Nicola Persico and Andrew Postlewaite 2004). Explanations proffered include discrimination (e.g. Eng S. Loh 1993), self esteem (e.g. Timothy A. Judge and Daniel M. Cable 2004), social skills learned during extracurricular activities in high school (Persico and

Postlewaite 2004), and intelligence due to better nutrition (Anne Case and Christina Paxson 2008). We add competitiveness. We measured height and competitiveness in a sample of over 1300 subjects. Participants in the experiment performed a task and were asked to choose how to be paid—either according to a piece rate or a winner-take-all scheme. We find that, even while controlling for gender, the tallest quartile are one and a half times as likely to choose the competitive payment scheme as the shortest quartile. The result is stronger for men than women. Furthermore, subjects of a given height compete more if they come from villages with lower average height. We interpret this evidence in terms of a generalized aggression hypothesis—taller men learn to be more aggressive because they are more likely to win and less likely to get hurt when they are aggressive.