

Social and Affective Motivations in Decision-Making

Professor Luke Chang, PhD

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| PSYC 53 Spring 2017 | MWF 11:30-12:35 x-period Tuesday 12:15-1:05 |
| Office Hours Location: Moore Hall 357 | Wed 1-3pm luke.j.chang@dartmouth.edu 603.646.2056 |

COURSE DESCRIPTION AND OBJECTIVES

Why do we tip restaurant servers, cab drivers, and coffee baristas? Why does our grocery shopping behavior change when we are hungry? This course will explore the social and affective motivations that influence how we make everyday decisions from the diverse perspectives of psychology, economics, and neurobiology. This course will provide an introduction to how social psychological constructs and feelings can be modeled using tools from decision theory (e.g., value & uncertainty) and how these processes might be instantiated in the brain. Topics to be covered include other-regarding preferences (e.g., trust, reciprocity, fairness, and altruism), affective motivations (e.g., risk, dread, regret, and guilt), and social considerations (e.g., reputation, conformity, and social-comparison). Each class will start with a lecture and will finish with a discussion of the readings lead by students.

- 1) Learn how social and affective motivations can be formally operationalized in terms of decision/economic theory
- 2) Learn how these motivations can be empirically studied
- 3) Learn how these motivations are represented in the brain
- 4) Learn how these ideas can be applied to real-world applications

Requirements:

PSYC: 23, 27 or 28

ASSIGNMENTS

READINGS We will be reading published peer-reviewed articles and book chapters from psychology, economics, and neuroscience. Reading the materials before class is essential to a successful course experience. Some of the readings can be dense. Reading the materials before class will aid in being 'primed' to understand the lecture or presentation material and is essential to participating in the class discussions. The reading list and electronic PDFs (or links) will be posted on Canvas.

DISCUSSION QUESTIONS (10% of grade) Understanding the key concepts presented in the readings and how they are related to your own interests and lives is a core component of the course. Two discussion questions must be uploaded to canvas **BEFORE 7PM** the day before each class. One question should directly address an issue that arises from the material. This could be a critique of the theory or empirical

study, or a proposal for how this might be studied differently. The second question should attempt to address how a concept might apply to society more broadly. What might be the broader implications of this work and how might it affect policy decisions? Late discussion questions will not be accepted. However, each student will have three 'free' days in which they do not need to submit a question, please plan accordingly. Questions begin the second week of class (4/5/17).

TOPIC PRESENTATION (20% of grade) Communicating science is a critical skill for psychologists. Each student will prepare and deliver a lecture on a course topic with a partner. Students are expected to prepare a lecture with slides covering the main points in the readings. Presenters will need to do additional background reading. Presenters are encouraged to meet with Professor Chang during office hours to help prepare for their presentation. This might include help identifying the key points, preparing an outline, or locating additional references. Presentations are expected to be *clear, accurate, and engaging*. Do your best to add *relevant examples, informative visual aids, and interactivity*. Finally, don't be afraid to express your *own opinion* and interests this can help make the topic more relevant to others. There is no need to submit discussion questions on topics you are presenting. Your presentations should be about 25 minutes long.

DISCUSSION MODERATOR (10% of grade) Each student will lead the class discussion with a partner. The idea is not to merely recapitulate the material covered in lecture, but rather to stimulate discussions evaluating the concepts, the empirical studies supporting the work, and the broader implications of the work. Presenters are encouraged to incorporate class discussion questions and may need to read additional material on the topic if necessary. Moderators are encouraged to use creative strategies to stimulate discussion.

CLASS PARTICIPATION (5% of grade) A key aspect of this course is digesting the material and relating it to real world applications. You will be expected to be prepared to discuss the required readings each day of class. The discussions will largely be driven by topics that you and your peers find interesting or controversial in the readings.

SHORT PAPER (30% of grade) Each student will individually write **two** separate short papers on a course topic of their choosing. One topic should relate broadly to affective and the other to social aspects of decision-making. The topics can be based on anything covered in class or raised in discussions. The paper should provide a *thesis* stating your opinion and a brief *background* for the context. You will then describe several *empirical or theoretical articles* to support your argument. You will close with a summary and a brief *discussion* noting any caveats for interpreting your points or possible new future research directions. I am most interested in your ability to generate an *original idea* and support it using literature. Papers might propose a new experiment or theory, critique an existing experiment or theory, or discuss the broader psychological and societal implications. This should be written like a normal academic essay and must include a citation list in APA style. Format: 5-7 typed double-space pages, 11pt Ariel or Times font. (bibliography not included in the page limit).

FINAL PROJECT (25% of grade) Most courses in psychology focus on studying abstract concepts with little focus on how these concepts might meaningfully impact

everyday life. This course has been selected to be a social impact practicum by the [Dartmouth Center for Service](#). For your final project you will work in small groups (2-5) to address a research question proposed by a local non-profit community organization. This project will entail selecting a particular problem from a set of 4 organizations. You will work together in small groups based on shared interest on a specific topic to collaboratively develop a solution to the dilemma.

- You must use at least *one concept* related to the course.
- You will briefly *present* your project to the class as a *group* (10% of grade).
- You will *individually write* up a paper summarizing the solution (15% of grade). This project write up will include (a) background research on the problem, (b) your proposed solution, (c) the costs and benefits of the solution, and (d) the potential impact towards the project goal. With your permission, your paper will be shared with the organization so that they may try to implement the proposed solution, so make sure it is practical.
- Your project might include: a thorough review of background literature, a new survey, data analysis and visualization of available data.
- This should be written like a normal academic essay and must include a citation list in APA style. Format: 8-15 typed double-space pages, 11pt Ariel or Times font. (bibliography not included in the page limit).

Paper due by midnight 6/2. *Late papers are accepted, but one letter grade lower for each 24 hr period it is late. This includes lateness due to conflicts related to athletics and other coursework (plan ahead).

CLASSROOM POLICIES

HONOR CODE Students in PSYC 53 are expected to strictly adhere to the Dartmouth Academic Honor Principle. As described in the Student Handbook, fundamental to the principle of independent learning is the requirement of honesty and integrity in the performance of academic assignments, both in the classroom and outside. Dartmouth operates on the principle of academic honor. Students who submit work that is not their own or who commit other acts of academic dishonesty will forfeit the opportunity to continue at Dartmouth. If you have questions or concerns regarding this policy during the course, please contact Professor Chang.

PLAGIARISM Writing about scientific publications without just rephrasing is difficult, particularly when not everything is fully understood. Doing this properly takes time and practice, and one goal of the course is to move us in that direction. I don't expect to see a perfect scientific treatment at this stage. But I do want to see evidence of **independent thought** when considering the material and implications (rather than just regurgitating it), and some degree of creativity. When quoting, be sure appropriate citations are made.

MISSED EXAM OR ASSIGNMENT A student will only be excused from an assignment by permission of the Instructor and on the basis of a written note from a dean, doctor, or supervisor of official college- sponsored events being held off-campus and requiring a students' absence. If excused, a make-up must be taken as soon as possible (usually within 1 day of the originally-scheduled exam/assignment date).

LATE ASSIGNMENTS All papers and presentations are due at the date and time specified. Late discussion questions will not be accepted, though please note that you

will only be graded on questions for 24/26 classes. Scores for late papers will be reduced by 10% for every 24-hour period a paper is late. No extensions will be granted due to computer failure, roommate difficulties, printing problems, etc. According to College policy, there are no excused absences from class for participation in College-sponsored extracurricular activities.

TECHNOLOGY Computers and tablets may be used in class, but use of cell phones will not be permitted (no phone calls, ringers, or texting).

DISABILITIES Any student with a documented disability needing academic adjustments or accommodations is requested to speak with me **by the end of the second week of the term**. All discussions will remain confidential, although the Academic Skills Center may be consulted to verify the documentation of the disability.

RELIGIOUS OBSERVANCES Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance which conflicts with your participation in the course, please meet with me **by the end of the second week of the term** to discuss appropriate accommodations.

RESOURCES Please see the shared google document for a list of helpful links and resources to help your learning experience <http://bit.ly/1RD8Oqy>

READINGS (Course readings are subject to change)

TOPIC 1: INTRODUCTION TO DECISION-MAKING

Introduction to decision theory

Hastie, R. & Dawes, R.M. (2010). Chapter 1: Thinking and Deciding. *Rational choice in an uncertain world: The psychology of judgment and decision making*. Sage Publications.

Hastie, R. & Dawes, R.M. (2010). Chapter 2: What is Decision Making? *Rational choice in an uncertain world: The psychology of judgment and decision making*. Sage Publications.

Hastie, R. & Dawes, R.M. (2010). Chapter 3: A General Framework for Judgment. *Rational choice in an uncertain world: The psychology of judgment and decision making*. Sage Publications.

Heuristics and Biases

Hastie, R. & Dawes, R.M. (2010). Chapter 4: The Fundamental Judgment Strategy. *Rational choice in an uncertain world: The psychology of judgment and decision making*. Sage Publications.

Hastie, R. & Dawes, R.M. (2010). Chapter 5: Judging Heuristically. *Rational choice in an uncertain world: The psychology of judgment and decision making*. Sage Publications.

Hastie, R. & Dawes, R.M. (2010). Chapter 6: Explanation-Based Judgments. *Rational choice in an uncertain world: The psychology of judgment and decision making*. Sage Publications.

Decisions under uncertainty; Introduction to preferences

Hastie, R. & Dawes, R.M. (2010). Chapter 8: Thinking Rationally about Uncertainty. *Rational choice in an uncertain world: The psychology of judgment and decision making*. Sage Publications.

Hastie, R. & Dawes, R.M. (2010). Chapter 9: Evaluating Consequences. *Rational choice in an uncertain world: The psychology of judgment and decision making*. Sage Publications.

Hastie, R. & Dawes, R.M. (2010). Chapter 10: From Preferences to Choices. *Rational choice in an uncertain world: The psychology of judgment and decision making*. Sage Publications.

TOPIC 2: DECISION-MAKING AND EMOTION

What is an emotion?

Tooby, J., & Cosmides, L. (2010). Chapter 8 The evolutionary psychology of the emotions and their relationship to internal regulatory variables. *Handbook of emotions (3rd edition)*. Lewis, M., Haviland-Joines, J.M., & Feldman Barrett, L. (Eds). Guilford Press.

Clore, G.L., & Ortony, A. (2010). Chapter 39 Appraisal theories, how cognition shapes affect into. *Handbook of emotions (3rd edition)*. Lewis, M., Haviland-Joines, J.M., & Feldman Barrett, L. (Eds). Guilford Press.

Homeostatic States

Panskepp, J. (1998). Chapter 9: Energy is delight: The pleasures and pains of brain regulatory systems. *Affective Neuroscience: the foundations of human and animal emotions*. Oxford University Press.

Chang, L.J. & Jolly, E. (In Press). *Emotions as computational signals of goal error*. In Nature of Emotion, Fox, D., Lapate, R., Shackman, A., & Davidson, R.J (Eds). Oxford Press.

Robinson, M. J., & Berridge, K. C. (2013). Instant transformation of learned repulsion into motivational “wanting”. *Current Biology*, 23(4), 282-289.

Incidental emotions

Loewenstein, G., & Lerner, J. S. (2003). The role of affect in decision making. In R. J. Davidson, K. R. Scherer & H. H. Goldsmith (Eds.), *Handbook of affective sciences*: Oxford University Press.

Lerner, J. S., Small, D. A., & Loewenstein, G. (2004). Heart strings and purse strings: Carryover effects of emotions on economic decisions. *Psychol Sci*, 15(5), 337-341.

Risky Feelings

Dunn, B. D., Dalgleish, T., & Lawrence, A. D. (2006). The somatic marker hypothesis: A critical evaluation. *Neuroscience & Biobehavioral Reviews*, 30(2), 239-271.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychol Bull*, 127(2), 267-286.

Regret

Gilovich, T., & Medvec, V. H. (1995). The experience of regret: what, when, and why. *Psychological review*, 102(2), 379.

Coricelli, G., Critchley, H. D., Joffily, M., O'Doherty, J. P., Sirigu, A., & Dolan, R. J. (2005). Regret and its avoidance: a neuroimaging study of choice behavior. *Nat Neurosci*, 8(9), 1255-1262.

TOPIC 3: ANTICIPATED VALUE

Anticipated value

Loewenstein, George. (1996). Out of control: Visceral influences on behavior. *Organizational Behavior and Human Decision Processes*, 65(3), 272-292.

Van Boven, L., & Loewenstein, G. (2003). Social projection of transient drive states. *Pers Soc Psychol Bull*, 29(9), 1159-1168. doi: 10.1177/0146167203254597

Mellers, Barbara A., & McGraw, A Peter. (2001). Anticipated emotions as guides to choice. *Current Directions in Psychological Science*, 10(6), 210-214.

Dread

Loewenstein, George. (1987). Anticipation and the valuation of delayed consumption. *The Economic Journal*, 666-684.

Berns, G. S., Chappelow, J., Cekic, M., Zink, C. F., Pagnoni, G., & Martin-Skurski, M. E. (2006). Neurobiological substrates of dread. *Science*, 312(5774), 754-758.

Story, G. W., Vlaev, I., Seymour, B., Winston, J. S., Darzi, A., & Dolan, R. J. (2013). Dread and the disvalue of future pain.

Affective Forecasting

Gilbert, D. T., Pinel, E. C., Wilson, T. D., Blumberg, S. J., & Wheatley, T. P. (1998). Immune neglect: a source of durability bias in affective forecasting. *Journal of personality and social psychology*, 75(3), 617.

Wilson, Timothy D., and Daniel T. Gilbert. "Affective forecasting." *Advances in experimental social psychology* 35 (2003): 345-411.

TOPIC 5: INTRODUCTION TO SOCIAL DECISION-MAKING

Introduction to social decision-making

Rilling, J. K., & Sanfey, A. G. (2011). The neuroscience of social decision-making. *Annu Rev Psychol*, 62, 23-48. doi: 10.1146/annurev.psych.121208.131647

Ruff, C. C., & Fehr, E. (2014). The neurobiology of rewards and values in social decision making. *Nature Reviews Neuroscience*, 15(8), 549-562.

Cheong, J.H., Jolly, E., Sul, S., & Chang, L.J. (In Press). *Computational models in social neuroscience*. In *Computational of Brain and Behavior*, Moustafa, A (Ed), Wiley-Blackwell.

Economic Games

Camerer, C.F. (2003). Chapter 2: Behavioral Game Theory. New York: Russell Sage Foundation.

Levitt, S. D., & List, J. A. (2007). What do laboratory experiments measuring social preferences reveal about the real world?. *The journal of economic perspectives*, 153-174.

Strategic Reasoning/Mentalizing

Frith, Chris D, & Frith, Uta. (2006). The neural basis of mentalizing. *Neuron*, 50(4), 531-534.

Camerer, C. F., Ho, T. H., & Chong, J. K. (2015). A psychological approach to strategic thinking in games. *Current Opinion in Behavioral Sciences*, 3, 157-162.

Hampton, A. N., Bossaerts, P., & O'Doherty, J. P. (2008). Neural correlates of mentalizing-related computations during strategic interactions in humans. *Proc Natl Acad Sci U S A*, 105(18), 6741-6746.

Coricelli, G., & Nagel, R. (2009). Neural correlates of depth of strategic reasoning in medial prefrontal cortex. *Proceedings of the National Academy of Sciences*, 106(23), 9163-9168.

TOPIC 6: SOCIAL PREFERENCES

Introduction to social preferences

Fehr, E., & Camerer, C. F. (2007). Social neuroeconomics: the neural circuitry of social preferences. *Trends Cogn Sci*, 11(10), 419-427.

Mobbs, D., Yu, R., Meyer, M., Passamonti, L., Seymour, B., Calder, A. J., ... & Dalgleish, T. (2009). A key role for similarity in vicarious reward. *Science*, 324(5929), 900-900.

Henrich, J., McElreath, R., Barr, A., Ensminger, J., Barrett, C., Bolyanatz, A., . . . Ziker, J. (2006). Costly punishment across human societies. *Science*, 312(5781), 1767-1770. doi: 312/5781/1767 [pii]

Bargaining

Sanfey, A. G., Rilling, J. K., Aronson, J. A., Nystrom, L. E., & Cohen, J. D. (2003). The neural basis of economic decision-making in the Ultimatum Game. *Science*, 300(5626), 1755-1758.

Xiao, E., & Houser, D. (2005). Emotion expression in human punishment behavior. *Proc Natl Acad Sci U S A*, 102(20), 7398-7401.

Fairness & Reciprocity

Dawes, C. T., Fowler, J. H., Johnson, T., McElreath, R., & Smirnov, O. (2007). Egalitarian motives in humans. *Nature*, 446(7137), 794-796.

Crockett, M. J., Kurth-Nelson, Z., Siegel, J. Z., Dayan, P., & Dolan, R. J. (2014). Harm to others outweighs harm to self in moral decision making. *Proceedings of the National Academy of Sciences*, 111(48), 17320-17325.

Falk, A., Fehr, E., & Fischbacher, U. (2003). On the nature of fair behavior. *Economic Inquiry*, 41(1), 20-26.

Sul, S., Guroglu, B., Crone, E.A., & Chang, L.J. *Medial prefrontal cortical thinning mediates shifts in other-regarding preferences during adolescence*. Manuscript under review.

[OPTIONAL]

Fehr, E., & Schmidt, K.M. (1999). A theory of fairness, competition, and cooperation. *Quarterly Journal of Economics*, 114(3), 817-868.

Rabin, M. (1993). Incorporating fairness into game theory and economics. *American Economic Review*, 83(5), 1281-1302.

Social Norms

Bicchieri, C. (2006). Chapter 1. The rules we live by. *The grammar of society: the nature and dynamics of social norms*. Cambridge University Press.

Montague, P. R., & Lohrenz, T. (2007). To detect and correct: norm violations and their enforcement. *Neuron*, 56(1), 14-18.

Chang, L. J., & Koban, L. (2013). Modeling emotion and learning of norms in social interactions. *The Journal of Neuroscience*, 33(18), 7615-7617.

Xiang, T., Lohrenz, T., & Montague, P. R. (2013). Computational Substrates of

Norms and Their Violations during Social Exchange. *J Neurosci*, 33(3), 1099-1108. doi: 10.1523/JNEUROSCI.1642-12.2013

Social Conformity

Zaki, J., Schirmer, J., & Mitchell, J. P. (2011). Social influence modulates the neural computation of value. *Psychological Science*, 22(7), 894-900.

Klucharev, V., Hytönen, K., Rijpkema, M., Smidts, A., & Fernández, G. (2009). Reinforcement learning signal predicts social conformity. *Neuron*, 61(1), 140-151.

Campbell-Meiklejohn, D. K., Bach, D. R., Roepstorff, A., Dolan, R. J., & Frith, C. D. (2010). How the opinion of others affects our valuation of objects. *Current Biology*, 20(13), 1165-1170.

[OPTIONAL] Bernheim, B. D. (1994). A theory of conformity. *Journal of political Economy*, 841-877.

TOPIC 7: TRUST

Trust

Kosfeld, M., Heinrichs, M., Zak, P. J., Fischbacher, U., & Fehr, E. (2005). Oxytocin increases trust in humans. *Nature*, 435(7042), 673-676. doi: nature03701 [pii]

Delgado, M. R., Frank, R. H., & Phelps, E. A. (2005). Perceptions of moral character modulate the neural systems of reward during the trust game. *Nature neuroscience*, 8(11), 1611-1618.

Fareri, D. S., Chang, L. J., & Delgado, M. R. (2015). Computational substrates of social value in interpersonal collaboration. *J Neurosci*, 35(21), 8170-8180. doi: 10.1523/JNEUROSCI.4775-14.2015

Guilt & Reputation

Knoch, D., Schneider, F., Schunk, D., Hohmann, M., & Fehr, E. (2009). Disrupting the prefrontal cortex diminishes the human ability to build a good reputation. *Proc Natl Acad Sci U S A*. doi: 0911619106 [pii]

Chang, L. J., Smith, A., Dufwenberg, M., & Sanfey, A. G. (2011). Triangulating the neural, psychological, and economic bases of guilt aversion. *Neuron*, 70(3), 560-572. doi: 10.1016/j.neuron.2011.02.056.

Chang, L.J. & Smith, A. (2015). Social emotions and psychological games. *Current Opinions in Behavioral Science*.

Altruistic Punishment

Fehr, E., & Gächter, S. (2002). Altruistic punishment in humans. *Nature*, 415(6868), 137-140.

de Quervain, D. J., Fischbacher, U., Treyer, V., Schellhammer, M., Schnyder, U., Buck, A., & Fehr, E. (2004). The neural basis of altruistic punishment. *Science*, 305(5688), 1254-1258.

Fowler, J. H., & Christakis, N. A. (2010). Cooperative behavior cascades in human social networks. *Proceedings of the National Academy of Sciences*, 107(12), 5334-5338.

Gossip

Feinberg, M., Willer, R., & Schultz, M. (2014). Gossip and ostracism promote cooperation in groups. *Psychological science*, 25(3), 656-664.

Jolly, E., & Chang, L.J. *Gossip drives vicarious learning and facilitates robust social connections*. Manuscript under review.

Sommerfeld, R. D., Krambeck, H. J., Semmann, D., & Milinski, M. (2007). Gossip as an alternative for direct observation in games of indirect reciprocity. *Proceedings of the National Academy of Sciences*, 104(44), 17435-17440.

TOPIC 8: ALTRUISM/SOCIAL COMPARISON

Charitable Giving

Andreoni, J. (1990). Impure altruism and donations to public goods: a theory of warm-glow giving. *The Economic Journal*, 100, 464-477.

Harbaugh, W. T., Mayr, U., & Burghart, D. R. (2007). Neural responses to taxation and voluntary giving reveal motives for charitable donations. *Science*, 316(5831), 1622-1625. doi: 316/5831/1622 [pii]

Moll, J., Krueger, F., Zahn, R., Pardini, M., de Oliveira-Souza, R., & Grafman, J. (2006). Human fronto-mesolimbic networks guide decisions about charitable donation. *Proceedings of the National Academy of Sciences*, 103(42), 15623-15628.

Social Comparison

Bault, N., Joffily, M., Rustichini, A., & Coricelli, G. (2011). Medial prefrontal cortex

and striatum mediate the influence of social comparison on the decision process. *Proc Natl Acad Sci U S A*, 108(38), 16044-16049. doi: 10.1073/pnas.1100892108

Fliessbach, K., Weber, B., Trautner, P., Dohmen, T., Sunde, U., Elger, C. E., & Falk, A. (2007). Social comparison affects reward-related brain activity in the human ventral striatum. *Science*, 318(5854), 1305-1308.

TOPIC 9: Group Decision Making

Group Decision-Making

Bahrami, B., Olsen, K., Latham, P. E., Roepstorff, A., Rees, G., & Frith, C. D. (2010). Optimally interacting minds. *Science*, 329(5995), 1081-1085.

Koriat, A. (2012). When are two heads better than one and why?. *Science*, 336(6079), 360-362.

Mahmoodi, A., Bang, D., Olsen, K., Zhao, Y. A., Shi, Z., Broberg, K., ... & Roepstorff, A. (2015). Equality bias impairs collective decision-making across cultures. *Proceedings of the National Academy of Sciences*, 112(12), 3835-3840.