LINDA W. CHANG

500 Jon M. Huntsman Hall   changlw@wharton.upenn.edu
3730 Walnut Street, Philadelphia PA 19104   www.iamlindachang.com

ACADEMIC POSITIONS

The Wharton School, University of Pennsylvania, Philadelphia, PA
MindCORE Postdoctoral Research Fellow with Katherine L. Milkman   September 2021-present

EDUCATION

Ph.D. Harvard University, Psychology   2021
Dissertation: Context-dependence in social decision-making
Advisor: Mina Cikara | Committee: Mahzarin Banaji, Max Bazerman, Sam Gershman

A.M. Harvard University, Psychology   2017

B.A. Yale University, Cognitive Science (with distinction)   2012

RESEARCH INTERESTS

judgment & decision-making; diversity, equity, & inclusion in organizations; behavior change

PEER-REVIEWED PUBLICATIONS ON DECISION-MAKING

1. **Chang, L. W.**, Gershman, S. J., & Cikara, M. (2019). Comparing value coding models of context-dependence in social choice. *Journal of Experimental Social Psychology, 85,* 103847.
2. **Chang, L. W.**, & Cikara, M. (2018). Social Decoys: Leveraging choice architecture to alter social preferences. *Journal of Personality and Social Psychology, 115*(2), 206-223.
3. **Chang, L. W.**, Krosch, A.R., & Cikara, M. (2016). Effects of intergroup threat on mind, brain, and behavior. *Current Opinion in Psychology, 11,* 69-73.

PAPERS UNDER REVIEW

4. **Chang, L. W.**, Kirgios, E. L., Rai, A., & Milkman, K. L. Evaluating the efficacy of shortlist quotas to promote gender diversity.
5. **Chang, L. W.**, Kirgios, E. L., Mullainathan, S., & Milkman, K. L. Does counting change what counts? Quantification fixation biases decision-making.
6. **Chang, L. W.**, Chang, E. H. On the limits of anonymization for promoting diversity in organizations.
7. Roy, E., …many authors including Kirgios, E. L., **Chang, L. W.,** Chang, E. H., …& Axt, J. A contest study to reduce discrimination in social judgment. (revise & resubmit). *Journal of Personality and Social Psychology.*

WORKING PAPERS AND SELECTED RESEARCH IN PROGRESS

8. **Chang, L. W.**, Cikara, M. Pre-commitment to evaluation criteria improves decision-making.
9. Cervantez, J. A., Pink, S. L., **Chang, L. W.**, Rai, A., & Milkman, K. L. Does diversity count? Using feedback to boost gender and racial representation.
10. Hu, X. E., **Chang, L. W.**, & Milkman, K. L. Making the case for diversity: How diversity narratives influence team performance.

PEER-REVIEWED PUBLICATIONS ON COMPARATIVE COGNITION

11. Johnston, A. M., **Chang, L. W.**, Wharton, K., & Santos, L. R. (2021). Dogs (*Canis familiaris*) prioritize independent exploration over looking back. *Journal of Comparative Psychology, 135*(3), 370-381.
12. McAuliffe, K., Bogese, M., **Chang, L. W.**, Andrews, C. E., Mayer, T., Faranda, A., Hamlin, J. K., Santos, L. R. (2019). Do dogs prefer helpers in an infant-based social evaluation task? *Frontiers in Psychology, 10*, 591.
13. McAuliffe, K., **Chang, L. W.**, Leimgruber, K. L., Spaulding, R., Blake, P. R., & Santos, L. R. (2015). Capuchin monkeys (*Cebus apella*) show no evidence for inequity aversion in a costly choice task. *Animal Behaviour, 103*, 65-74.

POPULAR PRESS

Chang, L. W. & Cikara, M. (2018, May 22). Want to Debias Hiring? Change What Hiring Managers Focus On. *Behavioral Scientist.* https://behavioralscientist.org/want-to-debias-hiring-change-what-hiring-managers-focus-on/

FELLOWSHIPS AND AWARDS

Winner of Best Symposium in the Organizational Behavior Division, AOM	2023
Finalist for Best Symposium in Managerial & Organizational Cognition Division, AOM	2023
MindCORE Postdoctoral Fellowship, University of Pennsylvania	2021-2024
Academic Grant, Sawtooth Software	2020
Summer Institute in Social and Personality Psychology (SISPP), SPSP	July 2019
Certificate of Distinction in Teaching, Harvard University, Derek Bok Center for Teaching and Learning	2018
Summer Predissertation Fellowship, Harvard University, GSAS	2018
Graduate Research Fellowship, National Science Foundation	2017-2020
Diversity Fund Graduate Travel Award, Society for Personality and Social Psychology	2017
Graduate Travel Award (declined), Society for Personality and Social Psychology	2017
Elsie Hopestill Stimson Research Grant, Harvard University, Psychology Department	2015
Rev. Mary A. Vanderbilt Scholarship Fund, Harvard University, GSAS	2015-2019
Mellon Mays - Edward Bouchet Undergraduate Fellowship, Yale University	2010

INVITED RESEARCH TALKS

HOPE Lab, Booth School of Business, University of Chicago, Chicago, IL   February 2023

OID Department Seminar, The Wharton School, University of Pennsylvania, Philadelphia, PA	October 2022
MindCORE Seminar Series, University of Pennsylvania, Philadelphia, PA	March 2022
Duckworth/Milkman Lab, University of Pennsylvania, Philadelphia, PA	November 2021
Emerging Scholars of Psychological Science, Princeton University, Princeton, NJ	October 2019
Office of Evaluation Sciences, United States General Services Administration, Washington D.C.	July 2019
Paluck Lab, Princeton University, Princeton, NJ	May 2019
Cooperation Lab, Boston College, Boston, MA	September 2018
Taste of Science: Dissecting the Mind, Boston, MA	April 2018
Social Psychology Brown Bag, Harvard University, Cambridge, MA	April 2018

CONFERENCE PRESENTATIONS

Chaired Symposia

Academy of Management (AOM), Boston, MA   2023
- New Perspectives on Increasing Diversity, Equity, and Inclusion (co-chaired with Sophia L. Pink). *Winner of Best Symposium in OB Division. Finalist for Best Symposium in MOC Division.*

International Association for Conflict Management (IACM), Thessaloniki, Greece   2023
- Understanding and Addressing Organizational Inequality and Diversity

Academy of Management (AOM), Seattle, WA   2022
- New Perspectives on Increasing Diversity and Reducing Inequality in Organizations (co-chaired with Aneesh Rai). *Selected as a showcase symposium.*

Presentations

Quantification fixation (Chang, Kirgios, Mullainathan, Milkman)
- Society for Judgment and Decision Making (SJDM), San Francisco, CA.   November 2023

Evaluating the efficacy of shortlist quotas to promote gender diversity (Chang, Kirgios, Rai, & Milkman)
- Diversity in Management and Organizations (DMO), Virtual   September 2023
- Academy of Management (AOM), Boston, MA.   August 2023
- International Association for Conflict Management (IACM), Thessaloniki, Greece.   July 2023
- Behavioral Science & Policy Association (BSPA), Virtual   May 2023
- Society for Personality and Social Psychology (SPSP), Atlanta, GA   February 2023
- Academy of Management (AOM), Seattle, WA.   August 2022

Does diversity count? Using feedback to boost gender and racial representation (Cervantez, Pink, Rai, Chang, & Milkman)
- Academy of Management (AOM), Boston, MA.   August 2023
- International Association for Conflict Management (IACM), Thessaloniki, Greece.   July 2023

Making the Case for Diversity: How Diversity Narratives Influence Team Performance (Hu, Chang, & Milkman)
- Academy of Management (AOM), Boston, MA.   August 2023

On the Limits of Anonymization for Promoting Diversity in Organizations (Chang & Chang)
- Academy of Management (AOM), Seattle, WA.   August 2022
- International Association for Conflict Management (IACM), Ottawa, Canada.   July 2022

Pre-commitment to evaluation criteria improves decision-making (Chang, Bazerman, Bohnet, & Cikara)

- Judgment and Decision Making Preconference at SPSP, Data-blitz, Virtual — February 2021
- Intervention Science Preconference at SPSP, Data-blitz, Virtual — February 2021

Who counts as context? (Chang & Cikara)
- New England Research on Decision-Making (NERD), Cambridge, MA. — June 2019

Social Decoys: Leveraging choice architecture to alter social preferences (Chang & Cikara)
- Association for Psychological Science Convention (APS), Washington, D.C. — May 2019
- New England Research on Decision-Making (NERD), Providence, RI. — May 2017

POSTER PRESENTATIONS

Quantification myopia (Chang, Kirgios, Mullainathan, Milkman)
- Society for Judgment and Decision Making (SJDM), San Diego, CA. — November 2022

Pre-commitment to evaluation criteria improves decision-making (Chang, Bazerman, Bohnet, Cikara)
- Social Cognition Preconference at SPSP, Virtual — February 2021

Who counts as context? (Chang & Cikara)
- Society for Personality and Social Psychology (SPSP), New Orleans, LA. — February 2020

Manipulating attribute exposure to drive social decoy effects (Chang & Cikara)
- Society for Personality and Social Psychology (SPSP), Portland, OR. — February 2019

Social decoys: Leveraging choice architecture to alter social preferences (Chang & Cikara)
- Society for Judgment and Decision Making (SJDM), New Orleans, LA. — November 2018

Divisive normalization drives context dependence in social choice (Chang, Gershman, & Cikara)
- Social & Affective Neuroscience Society (SANS), Brooklyn, NY. — May 2018
- Judgment and Decision-Making Preconference at SPSP, Atlanta, GA. — March 2018

Engineering opportunity: Manipulating choice architecture to attenuate social bias (Chang & Cikara)
- Association for Psychological Science Convention (APS), Boston, MA. — May 2017
- Society for Personality and Social Psychology (SPSP), San Antonio, TX. — January 2017
- Social Cognition Preconference at SPSP, San Antonio, TX. — January 2017

Capuchin monkeys show no evidence for inequity aversion in a costly choice task (Chang, Leimgruber, Spaulding, Blake, McAuliffe, Santos)
- Day of Cognitive Science at Yale University, New Haven, CT. — April 2015
- Society for Research in Child Development (SRCD), Philadelphia, PA. — March 2015

TEACHING EXPERIENCE

Teaching Fellow
Methods of Behavioral Research (Instructor: Mina Cikara), Harvard University — Spring 2018
Guest Lecturer
Science for Bioethicists (Instructor: Molly Lucas), Columbia University — Spring 2022
Applied Psychology Practicum (Instructor: Jenny Fauci), Boston College — Fall 2017

MENTORING AND SERVICE

New England Community Grants Program, Patagonia, Ventura, CA — 2022, 2023
Step-Ahead Mentorship Program (STAMP), MindCORE, University of Pennsylvania — 2021

Future Forward Program, Alum Presenter, Kent Place School, Middle School   2021
Diversity, Equity, and Inclusion Alum Council, Kent Place School, Summit, NJ   2020-present
Prospective Ph.D. & RA Event in Psychology (PPREP), Harvard Psychology Department   2020, 2021
Undergraduate Diversity Award Winners, Society for Personality and Social Psychology (SPSP)   2018
Leadership Alliance Program, Summer Research Opportunities at Harvard (SROH)   2018, 2020
Harvard Science Research Conference, Harvard College Undergraduate Research Association   2016
The ROOTS Project Inc., Bloomfield, NJ   2013-present
Martin Luther King Jr. Youth Empowerment Conference, Ceceilyn Miller Institute   2011-2012
Lead For Diversity, American Conference On Diversity   2008-2011

MEMBERSHIPS AND ASSOCIATIONS

Professional Affiliations
     Academy of Management (AOM), Association for Psychological Science (APS), International Association for Conflict Management (IACM), Society for Judgment and Decision Making (SJDM), Society for Personality and Social Psychology (SPSP)

Associations
     Association of Asian American Yale Alumni (AAYA), Yale GALA LGBT Alumni Association, Stable Planet Alliance

AD HOC REVIEWING

Behavioral Science & Policy, Cognitive Psychology, European Journal of Social Psychology, Group Processes & Intergroup Relations, Journal of Experimental Social Psychology, Management Science, Personality and Social Psychology Bulletin, Proceedings of the National Academy of Sciences

OTHER RESEARCH EXPERIENCE

Populations: *Canis dingo, Canis lupus familiaris, Cebus apella, Macaca mulatta,* human children & adults

Dingo Discovery & Research Centre, Victoria, Australia, PI: Laurie Santos   May 2015
Canine Cognition Center, Yale University, PI: Laurie Santos   2012-2015
Comparative Cognition Laboratory, Yale University, PI: Laurie Santos   2009-2012
Cayo Santiago Field Station, Puerto Rico, PI: Laurie Santos   November 2011
Mind and Development Laboratory, Yale University, PI: Paul Bloom   Summer 2011

APPENDIX: ABSTRACTS FROM PUBLISHED AND WORKING PAPERS

Chang, L. W., Kirgios, E. L., Rai, A., & Milkman, K. L. Evaluating the efficacy of shortlist quotas to promote gender diversity.

Shortlist quotas require organizations to include a minimum number (or fraction) of candidates with a given demographic identity (e.g., women) in their pool of finalists for a job and are widely used to increase diversity. But do they work? They may boost the diversity of hires by altering the composition of choice sets, or by signaling that diversity is valued. However, shortlist quotas may not affect final hiring choices since they are non-binding; they may also spur reactance. In four, pre-registered, incentive-compatible experiments including a shortlist and a hiring stage in a real hiring game, we test the impact of a shortlist quota requiring the inclusion of at least one woman in the finalist set considered for an opening. We also test whether informing hiring managers that finalist sets were required to include at least one woman undermines or enhances quotas' effectiveness. We find that shortlist quotas both (mechanically) increase the number of women included in finalist sets and significantly increase the number of finalist sets with more than one woman (by ~5.2%). Moreover, ~11-15% more women are eventually hired in games involving a shortlist quota, and this effect is larger (~15-19% more women are hired) when final hiring managers know a quota was implemented at the shortlist stage. Shortlist quotas boost perceptions that others choose women and that an organization believes gender diversity is valuable, both of which mediate the decision to select women at the shortlist stage and when making a final hire.

Chang, L. W., Kirgios, E. L., Mullainathan, S., & Milkman, K. L. Does counting change what counts? Quantification fixation biases decision-making.

Individuals and organizations often rely on numerical metrics to make decisions and form judgments. Numbers can be difficult to process, leading to under-utilization, but are also uniquely suited to making comparisons. Do we decide differently when some dimensions of a choice are quantified and others are not? We explore this question across six pre-registered experiments (N=7,000) involving managerial, policy, and consumer decisions. Participants face choices that involve trade-offs (e.g., choosing between employees, one of whom has higher potential but less commitment); we randomize which dimension of each tradeoff is presented numerically and which is presented qualitatively (using verbal estimates, discrete visualizations, or continuous visualizations). People systematically shift their preferences towards options that dominate on trade-off dimensions conveyed numerically. We identify one mechanism that underlies this quantification fixation: greater fluency of quantified information. Our findings suggest that when we count, we change what counts.

Chang, L. W. & Chang, E. H. On the Limits of Anonymization for Promoting Diversity in Organizations..

Anonymization of job applicant resumes is a commonly recommended strategy to increase diversity in organizations. However, real-world, large-scale tests of anonymization have shown mixed results for increasing diversity in interview call-back rates and job offers. We consider decision-makers' social dominance orientation (SDO), a measure of anti-egalitarianism/endorsement of group-based hierarchy, to illustrate one reason why anonymization has not been universally successful in the field. Across three pre-registered studies (N=3,000), we show that SDO predicts the likelihood of adopting anonymized hiring processes and moderates the effects of anonymization: lower SDO individuals are both more likely to opt into using anonymized hiring processes, and less likely to hire individuals from underrepresented groups when anonymization is used. Thus, ironically, opt-in anonymization policies can reduce the diversity of who is selected. More broadly, we suggest that policy evaluations need to account for the possibility that heterogeneous treatment effects and selection effects regarding who is most likely to adopt policies may inadvertently lead to outcomes that are contrary to the stated policy goals.

Chang, L. W. & Cikara, M. Pre-commitment to Evaluation Criteria Improves Decision-making.

Discrimination in employment contexts has been widely studied and documented. While various interventions have successfully decreased the impact of group-based bias in hiring, these interventions can have mixed results and may only apply to a limited set of scenarios. Across two experiments (N=1,200), we examined whether asking evaluators to pre-commit to evaluation criteria—by ranking criteria from most to least important *prior* to evaluating candidates—would decrease discrimination based on irrelevant information, such as the candidate's place of birth and body weight. When participants pre-committed to their criteria, they made *better* decisions (compared to control participants): specifically, they made more fine-grained distinctions between the different levels (e.g., very experienced vs. somewhat experienced) of the *relevant* criteria (e.g., previous experience). The results of these experiments have practical implications for how we structure decision-making processes in consequential social choices, including hiring and promotion, in pursuit of less discriminatory outcomes.

Chang, L. W., Gershman, S. J., & Cikara, M. (2019). Comparing value coding models of context-dependence in social choice. *Journal of Experimental Social Psychology*, *85*, 103847.

Decision-makers consistently exhibit violations of rational choice theory when they choose among several alternatives in a set (e.g., failing to buy the best product in a set when it is presented alongside high-quality alternatives). Many of society's most significant social decisions similarly involve the joint evaluation of multiple candidates. Are social decisions subject to the same violations, and if so, what account best characterizes the nature of the violations? Across five studies, we tested whether decision-makers exhibit context-

dependent preferences in hiring scenarios and past U.S. congressional race outcomes and compared different models of value coding as sources of the hypothesized context-dependence. Studies 1a, 1b, and 1d revealed that a divisive normalization value coding scheme best characterized participants' choices across a series of hiring decisions, and that participants exhibited context-dependent preferences. However, the distractor had the opposite effect of that predicted by divisive normalization once we accounted for the random effect of participant: as the value of the distractor increased, participants were more likely to hire the highest-valued candidate. In Study 2, we used a combination of archival electoral data and survey data to examine whether normalization models could explain the outcomes of congressional elections. Electoral outcomes were predicted by political candidates' inferred competence, but this time in line with the divisive normalization account. Our findings offer mixed support for a formal, neurobiologically-derived account of when and how specific alternatives exert their effects on social evaluation and choice, and highlight conditions under which high-value distractors increase versus decrease relative choice accuracy.

Chang, L. W., & Cikara, M. (2018). Social Decoys: Leveraging choice architecture to alter social preferences. *Journal of Personality and Social Psychology, 115*(2), 206-223.

Many of society's most significant social decisions are made over sets of individuals: for example, evaluating a collection of job candidates when making a hiring decision. Rational theories of choice dictate that decision makers' preferences between any two options should remain the same irrespective of the number or quality of other options. Yet people's preferences for each option in a choice set shift in predictable ways as function of the available alternatives. These violations are well documented in consumer behavior contexts: for example, the decoy effect, in which introducing a third inferior product changes consumers' preferences for two original products. The current experiments test the efficacy of *social decoys* and harness insights from computational models of decision-making to examine whether choice set construction can be used to change preferences in a hiring context. Across seven experiments (*N*=6,312) we find that participants have systematically different preferences for the exact same candidate as a function of the other candidates in the choice set (Experiments 1a–1d, 2) and the salience of the candidate attributes under consideration (Experiments 2, 3a, 3b). Specifically, compromise and (often) asymmetric-dominance decoys increased relative preference for their yoked candidates when candidates were counter-stereotypical (e.g., high warmth/low competence male candidate). More importantly, we demonstrate for the first time that we can mimic the effect of a decoy in the absence of a third candidate by manipulating participants' exposure to candidates' attributes: balanced exposure to candidates' warmth and competence information significantly reduced bias between the two candidates.

Chang, L. W., Krosch, A.R., & Cikara, M. (2016). Effects of intergroup threat on mind, brain, and behavior. *Current Opinion in Psychology, 11*, 69-73.

Intergroup threat is one catalyst that shifts us from out-group disregard to out-group hostility. We review recent interdisciplinary research that explores the effects of intergroup threat on mind, brain, and behavior. A rapidly growing literature indicates that several types of intergroup threat — for example, realistic threats such as competition and resource scarcity — have significant effects on empathy toward, perceptual judgments of, and cognitive representations of out-group members. We also briefly consider the emerging research assessing biological markers of intergroup threat sensitivity. Converging evidence from psychology and neuroscience may help to elucidate the precise pathways by which intergroup threat creates subtle discrimination as well as overt conflict.

APPENDIX: ABSTRACTS FROM PEER-REVIEWED COMPARATIVE COGNITION PUBLICATIONS

Johnston, A. M., **Chang, L. W.**, Wharton, K., & Santos, L. R. (2021). Dogs (*Canis familiaris*) prioritize independent exploration over looking back. *Journal of Comparative Psychology, 135*(3), 370-381.

It has been suggested that over the course of domestication, dogs developed the propensity to "look back" or gaze at humans when they encounter a challenging task. Unfortunately, little work to date has addressed the question of why dogs look back. To explore this issue, we conducted 3 experiments in which dogs had the option of doing something other than looking back at their owner when encountering an unsolvable task. In Experiments 1 and 2, dogs could look back or attempt an alternative puzzle. In both experiments, dogs attempted the alternative puzzle prior to looking back. In Experiment 3, when dogs encountered the unsolvable task, they could look back or attempt to solve the same puzzle using an alternate approach. As in Experiments 1 and 2, dogs attempted the alternate approach prior to looking back. Although some scholars have suggested that dogs may look back because they are overly reliant on humans, our findings suggest that dogs may instead prioritize independent exploration over looking back

McAuliffe, K., Bogese, M., **Chang, L. W.**, Andrews, C. E., Mayer, T., Faranda, A., Hamlin, J. K., Santos, L. R. (2019). Do dogs prefer helpers in an infant-based social evaluation task? *Frontiers in Psychology, 10*, 591.

Social evaluative abilities emerge in human infancy, highlighting their importance in shaping our species' early understanding of the social world. Remarkably, infants show social evaluation in relatively abstract contexts: for instance, preferring a wooden shape that helps another shape in a puppet show over a shape that hinders another character (Hamlin et al., 2007). Here we ask whether these abstract social evaluative abilities are shared with other species. Domestic dogs provide an ideal animal species in which to

address this question because this species cooperates extensively with conspecifics and humans and may thus benefit from a more general ability to socially evaluate prospective partners. We tested dogs on a social evaluation puppet show task originally used with human infants. Subjects watched a helpful shape aid an agent in achieving its goal and a hinderer shape prevent an agent from achieving its goal. We examined (1) whether dogs showed a preference for the helpful or hinderer shape, (2) whether dogs exhibited longer exploration of the helpful or hinderer shape, and (3) whether dogs were more likely to engage with their handlers during the helper or hinderer events. In contrast to human infants, dogs showed no preference for either the helper or the hinderer, nor were they more likely to engage with their handlers during helper or hinderer events. Dogs did spend more time exploring the hindering shape, perhaps indicating that they were puzzled by the agent's unhelpful behavior. However, this preference was moderated by a preference for one of the two shapes, regardless of role. These findings suggest that, relative to infants, dogs show weak or absent social evaluative abilities when presented with abstract events and point to constraints on dogs' abilities to evaluate others' behavior.

McAuliffe, K., **Chang, L. W.**, Leimgruber, K. L., Spaulding, R., Blake, P. R., & Santos, L. R. (2015). Capuchin monkeys (*Cebus apella*) show no evidence for inequity aversion in a costly choice task. *Animal Behaviour, 103*, 65-74.

Human adults and children respond negatively to inequity, even sacrificing personal gain to avoid both disadvantageous (more for you, less for me) and advantageous (more for me, less for you) resource allocations. Recent work has argued that some nonhuman animals share this response, but findings for inequity aversion outside of humans are controversial. Unfortunately, animals' negative responses to inequity are difficult to interpret because animal inequity aversion tasks differ in critical ways from the tasks used to test human inequity aversion. Here we present evidence from a novel task testing disadvantageous and advantageous inequity aversion in capuchin monkeys, *Cebus apella*. Our task was designed to closely mirror inequity aversion studies of human adults and children. We found no evidence for either disadvantageous or advantageous inequity aversion. Instead, capuchins' decisions were guided solely by the food resource that they were offered. Moreover, subjects' decisions and reaction times did not vary across social and nonsocial conditions. Our findings suggest that capuchin monkeys do not exhibit a human-like response to inequity on tasks in which even young children are known to demonstrate inequity aversion. We discuss these results in the context of existing theories for the evolution of fairness.