633 Clark Street Evanston, Illinois 60208-1119

Phone 847-491-7040 Fax 847-491-4434



Dear Members of the Northwestern Community:

It has been another impressive year in the world of undergraduate research at Northwestern. Our flagship Undergraduate Research Grant program continues to see significant growth. This summer we funded grants for 129 students, offering them opportunities to work full time on independent research and creative projects with faculty mentoring. Funding for the undergraduate research programs run through this office alone exceeded half a million dollars this year, and our programs are but one step in a long chain of opportunities for students to pursue their research interests. School and department run programs, work in faculty labs, and intense engagement programs abroad run by the Global Engagement Studies Institute and International Program Development are but a few of the programs available for our students. This extensive cross-collaborative list led us to build a searchable database so students could more easily find the wealth of experiences offered.

In addition, there have been two significant developments this year. First, we are continuing to develop programs to enable students to start on significant research and creative work earlier in their Northwestern careers. Our pilot Undergraduate Research Assistant Program more than doubled in size this year. In this program, students are hired by faculty members to work on their research or creative projects. The program emphasizes mentoring and the developing of research/creative skills that the students can later use to pursue their own projects. This summer students will be working with faculty such as Robert Gordon, Tracy Davis, and Sandra Waxman on major new research projects. In addition, my office has funded a student to work as an editor on a new feature film made by our own Spencer Parsons. Our second major development is evidenced by the change of name for this event. Formerly the Undergraduate Research Symposium, the event was renamed and expanded to offer more inclusion for our creative arts students. While continuing to offer space and support to the Meaningful Science Consortium and to encourage students to present their research findings, we have begun a Creative Arts Festival to showcase the incredible work being done all around campus. We are very excited about this development, and we hope it will build into a wonderful yearly event to showcase all the fine research and creative work done by our students.

We also realize that these projects are but one step in the development of our students and that none of these achievements would be possible without the tremendous support of Northwestern's outstanding faculty and staff. The mentoring, encouragement, and support provided not only helps students to have incredible experiences, but it also prepares them for the world beyond our campus. Undergraduate research and creative projects teach the process of critical thinking that leads to new knowledge that can change our world. It is evident by our recent graduates that these changes are taking place. In addition to moving on to top level positions in the professional world and enrolling in prestigious graduate programs, former participants in this event have secured some of academia's most esteemed graduate scholarships - Rhodes, Marshall, NSF, Gates, Fulbright, DAAD, and Churchill. These successes make us proud of the education offered by Northwestern and make us hopeful for our future.

Sincerely yours, que Daniel I. Linzer Provost

Exposition Logo Design by Taylor Barrett Weinberg College of Arts and Sciences, Class of 2012 Sociology / Creative Writing: Non-Fiction

The 2012 Undergraduate Research and Arts Exposition

Northwestern's tenth annual celebration of undergraduate research and creativity

in conjunction with Chicago Public High School students and teachers participating in the Meaningful Science Consortium

Monday, May 21, 2012

Norris University Center

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So Program of Events

9:30	Poster Session One: Louis Room (205)
11:00	Lunch N' Learn Oral Presentation Session One: Lake Room (203), Arch Room (206), Rock Room (207), Armadillo Room (208)
11:30	Meaningful Science Consortium Poster Session: Louis Room (205)
1:00	Lunch N' Learn Oral Presentation Session Two: Lake Room (203), Arch Room (206), Rock Room (207), Armadillo Room (208)
2:30	Poster Session Two: Louis Room (205)
4:00	Creative Writing Showcase Northwestern Room (202)
4:00	Student Film Festival: Short Films Wildcat Room (101)
4:00	Student Film Festival: <i>Experience for Beginners</i> (feature) Evans Room (102)
4:30	Performing Arts Festival: Louis Room (205)
6:00	Closing Reception : Big Ten Room (104) Open to all presenters and attendees

50 Steering Committee

Ronald Braeutigam, Associate Provost for Undergraduate Education
Stephen Carr, Associate Dean, McCormick School of Engineering
Peter Civetta, Assistant to the Associate Provost for Undergraduate Education
Sally Ewing, Associate Dean, School of Communication
Mary Finn, Associate Dean, Weinberg College of Arts and Sciences
Celina Flowers, Project Coordinator, Office of the Provost
Richard Gaber, Weinberg College of Arts and Sciences, Professor, Molecular Biosciences
Linda Garton, Assistant Dean, Henry and Leigh Bienen School of Music
Jana Measells, Advisor, Undergraduate Research Grants Program
Susan Olson, Assistant Dean, School of Education & Social Policy
Helen Schwartzman, Weinberg College of Arts and Sciences, Professor, Anthropology

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So Student Steering Committee

Christina Alexander Stephen Brand Jack Davis Emily DuBois Allison Finn Alex Goldklang Yoke Peng Leong Andrew Levin Leah Martin Rupin Parikh Anne Song

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So Exposition Planning & Organization

Peter Civetta

Exposition Coordinator Assistant to the Associate Provost for Undergraduate Education

Jana Measells

Exposition Co-coordinator & Program Editor Advisor, Undergraduate Research Grants Program

Gretchen Oehlschlager Administrative Assistant, Office of the Provost

Daphne Fair-Leary Administrative Assistant, Office of the Provost

Celina Flowers Project Coordinator, Office of the Provost

So Faculty Judges

Ravi Allada, Neurobiology and Physiology Christine Bell, Art History Jianhua Cang, Neurobiology and Physiology Stephen Carr, Materials Science and Engineering Richard Carthew, Molecular Biosciences Wei Chen, Mechanical Engineering Joan Chiao, Psychology S. Hollis Clayson, Art History; Kaplan Institute for the Humanities Margaret Dempster, French and Italian Jaime Dominguez, Political Science Andrew Dudley, Molecular Biosciences Sally Ewing, School of Communication Elzbieta Foeller-Pituch, Center for Historical Studies Richard Gaber, Molecular Biosciences Gary Galbreath, Biological Sciences Darren Gergle, Communication Studies William Haarlow, American Studies Abraham Haddad, Electrical Engineering and Computer Science Stephen Hill, African Studies; Office of Fellowships Katherine Hoffman, Anthropology; Asian and Middle East Studies Bonnie Honig, Political Science Jerome Hyun, Materials Science and Engineering Kyla Katz, School of Communication Peter Kaye, School of Continuing Studies Michael Kluppel, Pediatrics Carole Labonne, Molecular Biosciences Robert Lamb, Molecular Biosciences Hilarie Lieb, Economics Joan Linsenmeier, Psychology

80 Faculty Judges, continued

Eugene Lowe, Religious Studies Maria Mastronardi, Communication Studies Andreas Matouschek, Molecular Biosciences David McLean, Neurobiology and Physiology Thomas Meade, Chemistry; Molecular Biosciences; Neurobiology and Physiology; Radiology Denise Meuser, German Sonal Padalkar, Materials Science and Engineering Laura Panko, Biological Sciences Angela Ray, Communication Studies Jeff Rice, History Andrew Rivers, Physics and Astronomy Andrew Roberts, Political Science William Rogerson, Economics; Mathematical Methods in the Social Sciences Karl Rosengren, Psychology Eric Schulz, Economics Helen Schwartzman, Anthropology Mark Sheldon, Philosophy Yumi Shiojima, African and Asian Languages David Smith, Psychology Vera Teixeira, Spanish and Portuguese Regan Thomson, Chemistry Matthew Tresch, Biomedical Engineering; Physical Medicine and Rehabilitation; Physiology Akbar Virmani, African Studies Emily Weiss, Chemistry Michele Weldon, Journalism Sadie Wignall, Molecular Biosciences Mark Witte, Economics Bradley Zakarin, History; Office of Fellowships Nyree Zerega, Biological Sciences

Judges for the Meaningful Science Consortium Poster Presentations

David Bierschenk, The Graduate School Colleen Buzby, The Graduate School Karen Chien, The Graduate School Parag Gupta, The Graduate School Irma Kuljanishvili, Postdoctoral Fellow, McCormick School of Engineering and Applied Science Kevin Li, McCormick School of Engineering and Applied Science Kevin Luo, Weinberg College of Arts and Sciences Ruilong Ma, McCormick School of Engineering and Applied Science Yuri Malina, Weinberg College of Arts and Sciences Christina Mamalis, Weinberg College of Arts and Sciences Anne Mills, Weinberg College of Arts and Sciences Brian Quist, The Graduate School Andrew Radosevich, The Graduate School Katya Siddall, School of Continuing Studies Christina Thomas, Weinberg College of Arts and Sciences Joseph Walkowicz, Weinberg College of Arts and Sciences Lu Yao, Weinberg College of Arts and Sciences Aleksandr Zhukhovitskiy, Weinberg College of Arts and Sciences

2012 UNDERGRADUATE RESEARCH AND ARTS EXPOSITION <u>POSTER SESSIONS - LOUIS ROOM 205 MAP</u>



D O O R

2012 UNDERGRADUATE RESEARCH AND ARTS EXPOSITION STUDENT PRESENTER DIRECTORY (ALPHA BY LAST NAME)

STUDENT PRESENTER DIRECTORY (ALPHA BY LAST NAME)								
LAST NAME	FIRST NAME	PRESENTATION TYPE	PRESENTATION TITLE	TIME	ROOM	PROGRAM PAGE #		
Abbott	Isabel	PM Poster #9	Heavy Metal Leaching From Pottery Glazes	2:30 PM	Louis 205	8, 22		
Abraham	Aliza	PM Poster #10	Larval Zebrafish Prey Capture	2:30 PM	Louis 205	8, 22		
Aguilar	olot	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16		
Ahn	Jun Sung	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18		
Ahn	Jun Sung	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16		
Ahn	Soo Ho	Oral Presentation	Science and Engineering I	11:00 AM	Lake 203	4, 23		
Akpinar	Berkcan	PM Poster #13	Pharmacophore of Maoecrystal V	2:30 PM	Louis 205	8, 23		
Anderson	Michael	Performing Arts Festival	Flamenco and Fusion	4:30 PM	Louis 205	16		
Arkfeld	Daniel	Performing Arts Festival	ADRIA: Sonic Possibilities of the Saxophone	4:30 PM	Louis 205	17		
Awati	Neha	Oral Presentation	Science and Engineering 2	1:00 PM	Lake 203	6, 23		
Ayala	Jonathan	Creative Writing Showcas	The Difference the Sun Makes	4:00 PM	Northwestern 202	12		
Badawi	Karen	Oral Presentation	Chicago: Past and Present	11:00 AM	Armadillo 208	5, 24		
Baik	Jinhee Lily	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18		
Baleanu	Alexandra	Oral Presentation	Rationality, Emotions, and the Self	1:00 PM	Rock 207	7, 25		
Banaszynski	Britt	Performing Arts Festival	It's OK in the Day	4:30 PM	Louis 205	17		
Barker	Samuel	Oral Presentation	Voices of the Unexpected	1:00 PM	Arch 206	6, 25		
Barrett	Taylor	Oral Presentation	Chicago: Past and Present	11:00 AM	Armadillo 208	5, 26		
Behnke	Dana	Oral Presentation	Chicago: Past and Present	11:00 AM	Armadillo 208	5, 26		
Benjamin	Kaasha	PM Poster #27	CAPS Recommendations for Transparency	2:30 PM	Louis 205	9, 27		
Berman	Grace	AM Poster #34	Familiarity in Initial Attraction	9:30 AM	Louis 205	3, 27		
Boardman	Phil	PM Poster #44	TIF Transparency for Chicago's Inspector General	2:30 PM	Louis 205	9, 28		
Brackin	Maria	Oral Presentation	Rationality, Emotions, and the Self	1:00 PM	Rock 207	7,28		
Brock	Johnson	Performing Arts Festival	Ceremonial Sculpture: A Celebration of the Arts	4:30 PM	Louis 205	18		
Cackler	Rachel	AM Poster #27	Information Biases and Social Phobia	9:30 AM	Louis 205	2, 29		
Campos	Michael	Oral Presentation	Science and Engineering 2	1:00 PM	Lake 203	6, 30		
Caratelli	David	AM Poster #9	Neutrino Mass Hierarchy with LBNEs	9:30 AM	Louis 205	2, 30		
Carlin	Emma	Film Screening	Dump the Dump	4:00 PM	Wildcat 101	15		
Carter	Alice	PM Poster #8	Vista Alegre	2:30 PM	Louis 205	8, 31		
Castro	John	AM Poster #31	Operación Pedro Pan Revisited	9:30 AM	Louis 205	2, 31		
Chang	Qing	Performing Arts Festival	Treblemakers A Cappella	4:30 PM	Louis 205	18		
Chang	Tiffany	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18		
Chang	Tiffany	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16		
Chen	Jessica	AM Poster #20	Design for Health Center	9:30 AM	Louis 205	2, 32		
Chin	Yu Sun	Film Screening	FMO: Legacy of X	4:00 PM	Wildcat 101	15		
Chiu	Yuchi	Performing Arts Festival	Treblemakers A Cappella	4:30 PM	Louis 205	18		
Cho	Danny	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18		
Choi	Hee Jae	Oral Presentation	Science and Engineering I	11:00 AM	Lake 203	4, 23		
Choi	Jamie	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18		
Chung	Kristin	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18		
Concepcion	Samantha	Performing Arts Festival	Treblemakers A Cappella	4:30 PM	Louis 205	18		
Contos	Peter	PM Poster #44	TIF Transparency for Chicago's Inspector General	2:30 PM	Louis 205	9, 28		
Copeland	Justin	Performing Arts Festival	Flamenco and Fusion	4:30 PM	Louis 205	16		
Cortiñas	Gustavo	Performing Arts Festival	Flamenco and Fusion	4:30 PM	Louis 205	16		
Crocker	Sarah	PM Poster #1	John Donne's Sexual and Social Sacrament	2:30 PM	Louis 205	8, 32		
Cummins	Frank	AM Poster #20	Design for Health Center	9:30 AM	Louis 205	2, 32		
DeLallo	Brandon	Oral Presentation	Chicago: Past and Present	11:00 AM	Armadillo 208	5, 24		
Desai	Nirmit	AM Poster #21	iGEM Biosensor	9:30 AM	Louis 205	2, 33		
Dunbar	Alina	Oral Presentation	Voices of the Unexpected	1:00 PM	Arch 206	6, 33		
Dungca	Benedict	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16		
Echavarria	Kevin	AM Poster #1	What Matter Who's Speaking?	9:30 AM	Louis 205	2, 34		
Entz	Alex	Oral Presentation	Chicago: Past and Present	11:00 AM	Armadillo 208	5, 34		
Fang	Kimberly	Performing Arts Festival	Treblemakers A Cappella	4:30 PM	Louis 205	18		
Fefferman	Ann	PM Poster #31	Hooking Up	2:30 PM	Louis 205	9, 35		
Feuerstein	Betsy	Oral Presentation	Voices of the Unexpected	1:00 PM	Arch 206	6, 35		
Freeman	Sarah	Oral Presentation	Power and Politics	1:00 PM	Armadillo 208	7, 36		
Frost	Kyle	PM Poster #2	Bringing Outsider Art Into the Gallery	2:30 PM	Louis 205	8, 36		
Fuller	Shaina	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16		
Gates	Ashley	Film Screening	DIVA	4:00 PM	Wildcat 101	15		
Geringer	Paul	PM Poster #11	Matter Distribution of Perseus Cluster	2:30 PM	Louis 205	8, 37		
Giannitrapani	Jacklyn	Oral Presentation	World of Change/ Change the World	11:00 AM	Arch 206	4, 38		
Gladney	Rachel	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16		
Grosso	Nicolas	Oral Presentation	Science and Engineering 2	1:00 PM	Lake 203	6, 38		
Ham	Jungwha (Paula)	AM Poster #14	Characterization of pBMO From Strain CF8	9:30 AM	Louis 205	2, 39		
Han	Cree	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18		
Han	Cree	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16		

2012 UNDERGRADUATE RESEARCH AND ARTS EXPOSITION STUDENT PRESENTER DIRECTORY (ALPHA BY LAST NAME)

		STODENT PRE	SERVER DIRECTORY (ALFRA DI LAST N			PROGRAM
LAST NAME	FIRST NAME	PRESENTATION TYPE	PRESENTATION TITLE	TIME	ROOM	PAGE #
Han	Hyejung Hazel	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Hanson	Britta	AM Poster #2	Sodomy in the victorian Royal Navy	9:30 AM	Louis 205	2,39
Heiferman	leffrey	AIVI POSLET #5	Inhibition of 5-1 O Reduces Polyposis	9.30 AM	Louis 205	2,40
Hendrickson	Swen	Performing Arts Festival	Flamenco and Fusion	2.30 PM		16
Hendrickson	Swen	Performing Arts Festival	Fleur de Lune	4:30 PM		18
Hendrix	Nicole	Oral Presentation	Unlocking the Process of Learning	11:00 AM	Rock 207	5.41
Hittner	Emily	Oral Presentation	Unlocking the Process of Learning	11:00 AM	Rock 207	5, 41
Holsteen	Aaron	PM Poster #14	Vanadium Oxide Nanomechanical Resonators	2:30 PM	Louis 205	8, 42
Hong	Linda	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Hong	Linda	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16
Hong	Sarah	Oral Presentation	Power and Politics	1:00 PM	Armadillo 208	7, 42
Horin	Brett	AM Poster #20	Design for Health Center	9:30 AM	Louis 205	2, 32
Houskeeper	Sam	Oral Presentation	Chicago: Past and Present	11:00 AM	Armadillo 208	5, 34
Hubbard	Jasmine	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Hudson	Kian	PM Poster #29	Polarization and CA's Top-Two Primary	2:30 PM	Louis 205	9,43
lde	Samuel	Oral Presentation	Power and Politics	1:00 PM	Armadillo 208	7,43
Inwards	Sarah	Film Screening	Experience for Beginners	[4:00 PM	Evans 102	14
Jacobs	Samuel	Pivi Poster #19	Prodrugs to inhibit Mevalonate Pathway	2:30 PIVI	Louis 205	8,44
Jang	Amanda	PM Poster #45	Financing a New Vikings Stadium	2.30 PM	Louis 205	9 11
lok	Laura	Creative Writing Showcase	A Sad and Serious Situation	2.30 PM	Northwestern 202	12
Kang	Yunii	Performing Arts Festival	Afternarty & Co.: KPon Dance Cover Mashun	4:30 PM	Louis 205	18
Као	Jenn	Performing Arts Festival	Treblemakers A Cappella	4:30 PM	Louis 205	18
Kashani	Sara	AM Poster #19	Patients with Chronic Rhinosinusitis	9:30 AM	Louis 205	2, 45
Kavensky	Elisse	PM Poster #32	Gender and Cognitive Development in Cebu	2:30 PM	Louis 205	9, 45
Khadivian	Sasha Bayan	Oral Presentation	World of Change/ Change the World	11:00 AM	Arch 206	4, 46
Khadivian	Sasha Bayan	Performing Arts Festival	Flamenco and Fusion	4:30 PM	Louis 205	16
Kim	Chloe	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Kim	Dan	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Kim	Heejae Claire	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Kim	Jane	Performing Arts Festival	Treblemakers A Cappella	4:30 PM	Louis 205	18
Kim	Jenny	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Kim	Jenny	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16
Kim	Kristin	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Kim	IVIJ	Performing Arts Festival	Afternarty & Coll Keen Dance Cover Machun	[4:30 PIVI	Louis 205	18
KIIII Kluk	Matthow	AM Doctor #4	The Fantasy of the Maison Cubisto	4.50 PIVI	Louis 205	10
Kredit	Sheila	PM Poster #37	WIC and Breastfeeding	2.30 PM	Louis 205	9 47
Kremer	Kyle	Oral Presentation	Science and Engineering 2	1:00 PM	Lake 203	6 48
Krischer	Amy	AM Poster #28	Referential Intent Across SES	9:30 AM	Louis 205	2,48
Krishnamurthy	Pavan	PM Poster #38	Civic Participation and the Environment	2:30 PM	Louis 205	9,49
Kuforiji	Adele	Visual Arts Showcase	Ryan's Flower	All day	Louis 205	19
Lamano	Jonathan	AM Poster #10	Neuronal Morphology of ALS	9:30 AM	Louis 205	2, 49
Lee	Christine	Oral Presentation	Unlocking the Process of Learning	11:00 AM	Rock 207	5, 50
Lee	Hyerin	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Lee	Jessica J.	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Lee	Jessica S.	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Lee	John	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Lee	Stephanie	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18
Leung	Kingsley	Performing Arts Festival	Treblemakers A Cappella	4:30 PM	Louis 205	18
Li	Alice	Film Screening	FMO: Legacy of X	4:00 PM	Wildcat 101	15
Lidder	Alcina	AM Poster #29	Self-Statements, Emotion and Behavior	9:30 AM	Louis 205	2,50
Lin	Hannan	Film Screening	FMU: Legacy of X	[4:00 PM	Wildcat 101	15
LOEW	Allicop	AIVI POSLEF #32	The Ose of Nostalgia in Period Dramas	9:30 AIVI	Louis 205	3, 51
Marcos	Andrea	Oral Presentation	Interduction the Process of Learning	11:00 AM	Rock 207	5 51
Markey	Laura	Oral Presentation	Science and Engineering I	11:00 AM	Lake 203	4.52
McGee	Megan	PM Poster #3	The Nashville Parthenon	2:30 PM	Louis 205	8.52
McGill	Frances	Oral Presentation	World of Change/ Change the World	11:00 AM	Arch 206	4, 53
McGrath	Redmond	Oral Presentation	Chicago: Past and Present	11:00 AM	Armadillo 208	5, 54
McNulty	Meghan	AM Poster #20	Design for Health Center	9:30 AM	Louis 205	2, 32
Melbinger	Charlotte	PM Poster #4	Barbarian Queens in the Augustan Regime	2:30 PM	Louis 205	8, 54
Merlo	Catherine	Film Screening	Together in Winter	4:00 PM	Wildcat 101	14
Mescher	Daniel	Oral Presentation	Rationality, Emotions, and the Self	1:00 PM	Rock 207	7, 55

	2012 UNDERGRADUATE RESEARCH AND ARTS EXPOSITION STUDENT PRESENTER DIRECTORY (ALPHA BY LAST NAME)						
LAST NAME	FIRST NAME	PRESENTATION TYPE	PRESENTATION TITLE	TIME	ROOM	PROGRAM PAGE #	
Messing	Aaron	Performing Arts Festival	Fleur de Lune	4:30 PM	Louis 205	18	
Miles	Anna	Creative Writing Showcas	It was the Nightingale: Persephone's Play	4:00 PM	Northwestern 202	13	
Miller	Elizabeth	Film Screening	Dump the Dump	4:00 PM	Wildcat 101	15	
Mills	Ashley	Film Screening	FMO: Legacy of X	4:00 PM	Wildcat 101	15	
Nadig	Alok	PM Poster #46	Effects of Identity Shift on Indian LGBT	2:30 PM	Louis 205	9,55	
NICK	Elizabeth	AIVI POSTER #30	Addressment Coping	9:30 AM	Louis 205	2,56	
O'Hare	lustin	PM Poster #15	Genetic Analysis of Sleen and Anesthesia	2.30 PM		8 56	
Okoniewski	Stephen	Oral Presentation	Science and Engineering 2	1:00 PM	Lake 203	6.57	
Ong	Geneve	Performing Arts Festival	Treblemakers A Cappella	4:30 PM	Louis 205	18	
O'Tierney	Maris	Performing Arts Festival	maeve & quinn: fusion/fission	4:30 PM	Louis 205	16	
O'Tierney	Quinn	Performing Arts Festival	maeve & quinn: fusion/fission	4:30 PM	Louis 205	16	
Palarz	Kristin	AM Poster #21	iGEM Biosensor	9:30 AM	Louis 205	2, 33	
Pang	Kerri	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16	
Park	Jinah	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18	
Park	Kena	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18	
Park	Solbee	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18	
Pechman	Ali	Creative Writing Showcas	The Moon in the Room	4:00 PM	Northwestern 202	13	
Pilecki	Matthew	PM Poster #16	Optimization of Gene Vector Production	2:30 PM	Louis 205	8, 58	
Polonsky	Heather	PM Poster #30	Local Wellness Policies in Schools	2:30 PM	Louis 205	9, 58	
Porter	Robert	Oral Presentation	Science and Engineering I	11:00 AM	Lake 203	4, 59	
Possebom	Vitor Augusto	PIVI Poster #33	Environmental Kuznets Curve Within City	2:30 PM	Louis 205	9,59	
Purrier	Popiamin	AM Poster #33	Posistance and Privilage in Agriculture	9:30 AIVI	Louis 205	3,60	
Reiner	Michael	PM Poster #20	Cost-Renefit Analysis of 3 Systems	2.30 PM	Louis 205	8,00	
Reynolds	Fllen	PM Poster #3/	Reward Sensitivity in the Brain	2:30 PM	Louis 205	9.61	
Rhoad	Anna	Oral Presentation	Unlocking the Process of Learning	11:00 AM	Bock 207	5, 62	
Richter	Nora	PM Poster #17	Environmental Assessment of Hydropower	2:30 PM	Louis 205	8, 62	
Richter	Felix	AM Poster #11	Magnetic Nanostructures	9:30 AM	Louis 205	2,63	
Rivard	Elisabeth	PM Poster #6	The Professional Life of James Gillray	2:30 PM	Louis 205	8, 64	
Rodriguez	Kristina	PM Poster #35	Aphasia and Online Communication	2:30 PM	Louis 205	9, 64	
Rong	Sam	Performing Arts Festival	Treblemakers A Cappella	4:30 PM	Louis 205	18	
Roskey	Emily	Oral Presentation	Rationality, Emotions, and the Self	1:00 PM	Rock 207	7, 65	
Rothman	Melissa	Oral Presentation	World of Change/ Change the World	11:00 AM	Arch 206	4, 65	
Russell	Bill	PM Poster #47	Student Debt, Jobs & Graduate School Plans	2:30 PM	Louis 205	9, 66	
Schneider	Douglas	Performing Arts Festival	ADRIA: Sonic Possibilities of the Saxophone	4:30 PM	Louis 205	17	
Schnettler	Patrick	PM Poster #18	Encoding the PLT of Images Using an FPGA	2:30 PM	Louis 205	8,66	
Schultz	Charles	Performing Arts Festival	Ceremonial Sculpture: A Celebration of the Arts	4:30 PM	Louis 205	18	
Segar	Benjamin	Derforming Arts Fostival	Science and Engineering 2	1:00 PIVI	Lake 203	10,07	
Senginan	Sharona	Performing Arts restival	Fledr de Lulle	4.50 PIVI	Louis 205	10 67	
Sherer	Michael	AM Poster #21		9.30 AM		2 33	
Shin	Ki Fun	AM Poster #35	Sleep Rehearsal of Extinction Learning	9:30 AM	Louis 205	3.67	
Sizer	Devin	Oral Presentation	Power and Politics	1:00 PM	Armadillo 208	7.68	
Skopec	Peter	AM Poster #37	External Threat and Intra-NATO Behavior	9:30 AM	Louis 205	3, 69	
Sladek	Mike	AM Poster #39	Mood Affects Negative Body Talk in Women	9:30 AM	Louis 205	3, 69	
Sledd	Maggie	Oral Presentation	Science and Engineering I	11:00 AM	Lake 203	4, 70	
Smith	Eric Nathan	PM Poster #40	Individual Differences in Job Choice	2:30 PM	Louis 205	9, 70	
Smith	Bryant	AM Poster #12	Cluster Odd-Balls	9:30 AM	Louis 205	2, 71	
Srisarajivakul	Emily	PM Poster #7	Effects of Korean Pop Culture in America	2:30 PM	Louis 205	8, 71	
Stallknecht	Christina	Oral Presentation	World of Change/ Change the World	11:00 AM	Arch 206	4, 71	
Stevens	Daniel	PM Poster #21	Interpolated MCMC Jump Proposals	2:30 PM	Louis 205	8, 72	
Suen	Derek	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16	
Suggs	Sam	Performing Arts Festival	Flamenco and Fusion	4:30 PM	Louis 205	16	
Suh	Judy	Visual Arts Showcase	London Apparatus	All day	Louis 205	19	
Sub	Judy	Film Screening	Frompled By A FISH		Louis 205	19	
Sup	Judy Hababi	Porforming Arts Fostivel		4:00 PIVI		16	
Sun	Susan	PM Poster #25	Abnormal Chromy Methylation in Cancor	4.50 PIVI		9 72	
Swenson	loshua	PM Poster #/1	Faith Development and Personality	2.30 PM		9.73	
Tham	Dan	Film Screening	DIVA	4:00 PM	Wildcat 101	15	
Thomas	Jessina	AM Poster #15	Impact of Gleevec on Fertility	9:30 AM	Louis 205	2,73	
Tong	Liuchuan	PM Poster #26	Maoecrystal Z Synthesis Progress Report	2:30 PM	Louis 205	9, 74	
Topol	Sarah	Oral Presentation	Rationality, Emotions, and the Self	1:00 PM	Rock 207	7, 74	
Trocin	Kathleen	PM Poster #48	Bolivian Narratives of Contraceptive Use	2:30 PM	Louis 205	9, 75	

2012 UNDERGRADUATE RESEARCH AND ARTS EXPOSITION STUDENT PRESENTER DIRECTORY (ALPHA BY LAST NAME)							
LAST NAME	FIRST NAME	PRESENTATION TYPE	PRESENTATION TITLE	TIME	ROOM	PROGRAM PAGE #	
Viets	Kayla	PM Poster #22	Identification of a GAL1 GRS	2:30 PM	Louis 205	8, 75	
Vijayaraghavan	Mahima	Oral Presentation	Science and Engineering I	11:00 AM	Lake 203	4, 76	
Vizcaino	Rafael	Oral Presentation	Power and Politics	1:00 PM	Armadillo 208	7, 77	
Wang	Angela	Oral Presentation	Voices of the Unexpected	1:00 PM	Arch 206	6, 77	
Wang	Maria	AM Poster #17	Germination Techniques for D. leibergii	9:30 AM	Louis 205	2, 78	
Ward	Rebekah	PM Poster #23	A Test of Syntactic Island Effects	2:30 PM	Louis 205	9, 78	
Weber	Bryan	PM Poster #44	TIF Transparency for Chicago's Inspector General	2:30 PM	Louis 205	9, 28	
White	Steven	Performing Arts Festival	Fleur de Lune	4:30 PM	Louis 205	18	
Williams	Myrtie	Oral Presentation	Voices of the Unexpected	1:00 PM	Arch 206	6, 79	
Wong	Alexandra	PM Poster #49	Maturational Timing and Risky Behavior	2:30 PM	Louis 205	9, 79	
Woodhouse	Chloe	PM Poster #24	Gamma Band Activity in Memory Retrieval	2:30 PM	Louis 205	9, 80	
Yang	Yoonie	Film Screening	DIVA	4:00 PM	Wildcat 101	15	
Yarnik	Eric	AM Poster #40	Specificity in Implicit Skill Learning	9:30 AM	Louis 205	3, 81	
Yates	Elizabeth	AM Poster #38	Testing Allen's Rule	9:30 AM	Louis 205	3, 81	
Yoo	Sharon	Performing Arts Festival	Treblemakers A Cappella	4:30 PM	Louis 205	18	
Yoon	Andrew	Performing Arts Festival	Treblemakers A Cappella	4:30 PM	Louis 205	18	
Yu	Jennifer	Oral Presentation	Science and Engineering I	11:00 AM	Lake 203	4, 82	
Zayed	Alexandra	PM Poster #45	Financing a New Vikings Stadium	2:30 PM	Louis 205	9, 44	
Zhou	Brian	Performing Arts Festival	Afterparty & Co.: KPop Dance Cover Mashup	4:30 PM	Louis 205	18	
Zhou	Brian	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16	
Zhou	Daniel	Performing Arts Festival	ReFresH Dance Crew	4:30 PM	Louis 205	16	
Ziff	Alec	Film Screening	Experience for Beginners	4:00 PM	Evans 102	14	

50 Guide to Poster & Oral Presentations

80 Poster Session One

9:30-11:00, Louis Room (205)

Humanities & Arts

- 1. **Kevin Echavarria**, "What Matter Who's Speaking?' The Authorial Figure in Junot Díaz's *The Brief Wondrous Life of Oscar Wao*
- 2. Britta Hanson, "A Question of Tolerance: Sodomy in the Victorian Royal Navy"
- 3. Christine Hazday, "The Cuatro Is My Flag/ El Cuatro es mi Bandera"
- 4. Matthew Kluk, "The Maison Cubiste: Modernist Fantasy and Bourgeois Reality"

Natural Sciences & Engineering

- 9. **David Caratelli**, "Determining the Neutrino Mass Hierarchy through Long-Baseline Reactor Experiments"
- 10. **Jonathan Lamano**, "Neuronal Morphology of Amyotrophic Lateral Sclerosis: Characterization of Disease Progression at the Neuronal Level"
- 11. Felix Richter, "Magnetic Nanostructures for Potential Cancer Theranostics"
- 12. Bryant Smith, "Cluster Odd-Balls: Examining Peculiarities in Galaxy Clusters"
- 14. **Jungwha (Paula) Ham**, "Preliminary Characterization of Particulate Butane Monooxygenase (pBMO) from Nocardioides sp. Strain CF8"
- 15. Jessina Thomas, "Impact of Gleevec on Fertility Preservation for Cancer Patients"
- 17. **Maria Wang**, "Germination Techniques for *Dichanthelium leibergii*, a Cool Season Prairie Grass Affected by Habitat Fragmentation"
- 19. **Sara Kashani**, "Clinical Characteristics of Patients with Chronic Rhinosinusitis and Specific Antibody Deficiency"
- 20. Jessica I. Chen, Frank D. Cummins, Brett A. Horin, and Meghan McNulty, "Design for a Health Center in El Canton, Honduras"
- 21. Nirmit Desai, Kristin Palarz, and Michael Sherer, "Northwestern iGEM Team 2011 *Pseudomonas aeruginosa* Biosensor"

Social Sciences & Journalism

- 27. Rachel Cackler, "Information, Not Detection, Bias in Socially Anxious Individuals"
- 28. **Amy Krischer**, "Exploring Children's Use of Referential Intent to Learn New Words across Socio-Economic Strata"
- 29. Alcina Lidder, "Watch What You Say: Spoken Self-Statements, Emotion, and Behavior"
- 30. **Elizabeth Nick**, "Adolescent Coping: Associations with Age, Family Functioning and Depression"
- 31. **John Castro**, "Operación Pedro Pan Revisited: Examining Depictions from Granma to Government Agencies"

So Poster Session One, continued

- 32. **Madison Loew**, "The Use of Nostalgia in Period Dramas and Its Effects on Program Popularity"
- 33. Morgan Purrier, "Online Filler-Gap Dependency Formation and That-Trace Effect"
- 34. Grace G. Berman, "Getting to Know You: Familiarity as a Predictor of Liking"
- 35. **Ki Eun Shin**, "Having Therapy during Sleep? Improving Extinction Learning for People with Blood-Injection-Injury Fears by Rehearsing Memories during Sleep"
- 37. **Peter Skopec**, "Round the Corner, Not Over-the-Hill: How a Changing International Threat Environment at the End of the Cold War Triggered NATO's Vital Transformation"
- 38. **Elizabeth Yates**, "Testing Allen's Rule: Ecogeographic Variation in Three Native North American Human Samples"
- 39. Mike Sladek, "Mood Affects Frequency of Negative Body Talk in College Women"
- 40. Eric Yarnik, "Specificity in Implicit Skill Learning from Practice"

Solution Session One 11:00-12:30

Developments and Innovations in Science and Engineering I Lake Room (203) Moderator: Rick Gaber, Molecular Biosciences

- Soo Ho Ahn and Hee Jae Choi, "Training and Its Positive Effects on Brainstem Processing in Older Adults"
- Laura Markey, "The Leucine-Responsive Regulatory Protein (Lrp) Influences Multiple Symbiotic Phenotypes in *Vibrio fischeri* SR5"
- Robert Porter, "Tissue Specific Control of Organismal Proteostasis in Single-Tissue Hsp90 Knockdown"
- Maggie Sledd, "A dsRNA Based Screen Identifies Novel Proteins Involved in Drosophila Hedgehog Signaling Pathway"
- Mahima Vijayaraghavan, "Loss of Ganglioside GM3 Synthase Prevents Glucose-Induced Suppression of Keratinocyte Migration"
- Jennifer Yu, "The Role of the *Clock* Gene in Protection against Neural and Retinal Degeneration"

World of Change/ Change the World

Arch Room (206)

Moderator: Carolyn Chen, Sociology/ Asian American Studies

- **Jacklyn Giannitrapani**, "Breaking the Barriers to Regularization: The Informal Real Estate Market in the Argentine Shantytown Villa 31"
- Melissa Rothman, "The Paris of Latin America ¿Sos Bienvenido?"
- Sasha Bayan Khadivian, "Sonic Bonding: National Identity and the Music of the Oppressed in Brazilian Popular Music"
- Frances McGill, "The "Death of the Street?" Social Networks and Reimagined Space in Sidi Moumen"
- Christina Stallknecht, "If I Can't Dance I Don't Want Your Revolution! Dance in the Occupy Wall Street Movement"

So Lunch N' Learn: Oral Presentation Session One,

Unlocking the Process of Learning Rock Room (207) Moderator: Karl Rosengren, Psychology

Nicole Hendrix, "Language's Influence on Early Cognition"

Emily Hittner, "Musical Experience and Binaural Processing in the Auditory Brainstem"

Christine Lee, "Comparison of Acculturation and Parenting Style in Caucasian-American and Chinese-American Families"

Andrea Marcos, "Higher Education Alternatives for Disadvantaged Students"

Anna Rhoad, "Grasping Errors in Preschoolers and Adults"

Chicago: Past and Present

Armadillo Room (208) Moderator: Donald Gordon, Political Science

- **Taylor Barrett**, "Female Comedians: Negotiating the Gender Bias in Improvisational Comedy"
- **Dana Behnke**, "Competing for the Masses: The Morality Problem of Chicago Amusement Parks in the Early Twentieth Century"
- Brandon DeLallo and Karen Badawi, "City of Chicago's Office of Budget and Management, Final Recommendations"

Alex Entz and Sam Houskeeper, "The Chicago Public Schools System: Renaissance 2010"

Redmond McGrath, "A New Social Club: 1500 North Lake Shore Drive and the Chicago Wealthy's Move to Cooperative Apartments"

Lunch N' Learn Oral Presentation Session Two 1:00-2:30

Developments and Innovations in Science and Engineering II Lake Room (203) Moderator: Kimberly Gray, Civil and Environmental Engineering

- Neha Awati, "Multimodal Integration and Auditory Modulation in Fluent Whole-Word Reading"
- Michael Campos, "Titania-Silica Nanocomposites for Solar Fuel Production: Design, Synthesis, and Characterization"
- Nicolas Grosso, "Shape Selective Oxidation of Alcohols by Nanocavity Containing Titanium Dioxide Catalysts"
- Kyle Kremer, "Spin Tilts in the Double Pulsar Reveal Supernova Spin Angular-Momentum Production"
- Stephen Okoniewski, "Position Exchange Rates for Colloids Undergoing Brownian Motion in Narrow Channels"
- **Benjamin Segal**, "Pattern Formation in a Model of Competing Populations with Nonlocal Interactions"

Voices of the Unexpected Arch Room (206) Moderator: Jeff Rice, History

- Samuel Barker, "'The Number One (Digital) Princess in the World': VOCALOID, Hatsune Miku, and the Blending of Humanity and Technology"
- Alina Dunbar, "Competing Narratives on HIV/AIDS in South Africa: How Journalists and Healthcare Workers Perceive the Epidemic"
- Betsy Feuerstein, "Dakar Graffiti: The Discourse of the Street"
- Angela Wang, "From Jam to Brand: The Aesthetic Language of Occupy Wall Street"
- Myrtie Williams, "Our Voices Are PowerFro: Black Women and the Development of Diaspora Identity in the Online Natural Hair Community"

So Lunch N' Learn Oral Presentation Session Two,

Rationality, Emotions, and the Self Rock Room (207) Moderator: Vivasvan Soni, English

Alexandra Baleanu, "Emotions and Suboptimal Decision Making: I Know I'm Wrong, So What?"

Maria Brackin, "Trust and Epistemology: Are There Conflicting Demands for the Good Friend and the Rational Epistemic Agent?"

Daniel Mescher, "The Role of Identity in the Creative Process"

Emily Roskey, "Self-Identity and Global Concern in University Students"

Sarah Topol, "Good Grief!' Cicero, Grief, and the Stoic Critique of the Emotions"

Power and Politics

Armadillo Room (208) Moderator: John Bushnell, History

- Sarah Freeman, "The 'Post-Conflict' Problem: Transitional Failures from Emergency Relief to Sustainable Development for Internally Displaced Persons and the Need for Solutions"
- Rafael Vizcaino, "Re-Thinking Foucault's Relation to 'Power': Semantics, Fetishization, and Political Consequences"
- Sarah Hong, "The Changing Composition of Political Elites during Periods of Leadership Transition in East Asian Authoritarian Regimes"
- Samuel Ide, "Kyrgyzstan and China: Kyrgyz Elites' Opinions of a Giant Neighbor"
- **Devin Sizer**, "Straddling Spheres: Gender Ideologies and the Political Resistance of Southern Unionist Women of North Carolina"

Son Poster Session Two

2:30-4:00, Louis Room (205)

Humanities & Arts

- 1. Sarah Crocker, "John Donne's Sexual Sacrament: Holy Social and Sexual Intercourse"
- 2. Kyle Frost, "Bringing Outsider Art into the Gallery"
- 3. **Megan McGee**, "The Significance of the Nashville Parthenon on the Cultural Landscape of Nashville"
- 4. **Charlotte Melbinger**, "Barbarian Queens as the Oriental Other in the Augustan Regime"
- 5. **Benjamin Ratskoff**, "Resistance and Privilege: Organic Agriculture and Localism Encounter Inheritance"
- 6. **Elisabeth Rivard**, "The Professional Life and Politics of James Gillray: Satirical Caricature of the Georgian Era"
- Emily Srisarajivakul, "Hallyu Korean Popular Culture's Effects on the Perceptions of Masculinity, Interracial Dating, and Intraracial Dating Practices among American Students"

Natural Sciences & Engineering

- 8. Alice Carter, "Vista Alegre A Story of Environmental Change"
- 9. **Isabel Abbott**, "Heavy Metal Leaching from Pottery Glazes Exposed to Food-Like Conditions"
- 10. **Aliza Abraham**, "Characterizing the Sensory Input and Motor Output of Larval Zebrafish Prey Capture Behavior"
- 11. **Paul Geringer**, "Baryon Fraction and Mass Density Profiling of the Perseus Galaxy Cluster Utilizing XMM-Newton Observations"
- 12. **Jeffrey R. Heiferman**, "Inhibition of 5-Lipoxygenase Reduces Polyposis in APCDelta468 Mice"
- 13. Berkcan Akpinar, "Studies towards the Proposed Pharmacophore of Maoecrystal V"
- 14. **Aaron Holsteen**, "Intrinsic and Extrinsic Mechanical Dissipation within Vanadium Oxide Nanomechanical Resonators around the MIT Transition"
- 15. **Justin O'Hare**, "Genetic Analysis of Sleep and Circadian Behaviors and Volatile Gas Anesthetic Response via Forward Insertional Mutagenesis in *Drosophila melanogaster*"
- Matthew Pilecki, "Optimization of Lentiviral Vector Production Transfection Conditions via Physical and Active Titration Analysis for Gene Delivery in Spinal Cord Regeneration"
- 17. **Nora Richter**, "Programming an Assessment Tool to Evaluate Environmental Performance of Regulated Rivers"
- Patrick Schnettler, "Encoding the Polar Logarithmic Transforms (PLT) of Images Using a Virtex-6 FPGA and a Logarithmic Amplifier"
- 19. **JC Jacobs**, "Prodrug of Fluorinated Mevalonates to Inhibit the Mevalonate Pathway in *Streptococcus pneumonia*"
- 20. Michael Reiner, "Comparing Renewable Energy Sources in Rural Ecuador"
- 21. **Daniel J. Stevens**, "Interpolation Techniques for MCMC Parameter Estimation on Compact Binary Coalescence Gravitational-Wave Signals"
- 22. Kayla Viets, "Identification of a Gene Recruitment Sequence in the *GAL1* Promoter"

80 Poster Session Two, continued

- 23. **Rebekah Ward**, "A Test of Syntactic Island Effects"
- 24. **Chloe Woodhouse**, "Gamma Band Activity in Mathematical and Verbal Semantic Memory Retrieval; Invasive Neurophysiologic Brain Mapping"
- 25. Susan Sun, "Abnormal ChromosomeX Methylation in Breast Cancer"
- 26. Liuchuan Tong, "Progress towards the Total Synthesis of Maoecrystal Z"

Social Sciences & Journalism

- 27. **Kaasha Benjamin**, "Chicago Police Department- Chicago Alternative Policing Strategy (CAPS): Recommendations for Transparency and Government Accountability"
- 29. **Kian Hudson**, "The Donut Congress: The Top-Two Primary and the Missing Center in the California State Legislature"
- 30. Heather Polonsky, "Local Wellness Policies: A Recipe for Healthy Schools?"
- 31. Ann Fefferman, "A Suspension of Reality: University Campus Culture and Hooking Up"
- 32. Elisse Kavensky, "The Effects of Malnutrition Timing and Catch-Up Growth Velocities on Cognitive Development in Filipino Boys and Girls: A Non-Interventional Longitudinal Study in Cebu, Philippines"
- 33. Vítor Augusto Possebom, "Testing for Environmental Kuznets Curve within a City"
- 34. **Ellen Reynolds**, "Individual Differences in Reward Related Processing: A Study of Event Related Potentials"
- 35. Kristina Rodriguez, "Linguistic Markers for Aphasia in Online Communication"
- 37. **Sheila Kredit**, "Breastfeeding Cessation among WIC-Enrolled Immigrant, Hispanic, and African American Women in Chicago"
- 38. **Pavan Krishnamurthy**, "Civic Participation and the Environment: An Exploration of Volunteering Motives of College-Aged Students"
- 39. Sharona Sernik, "The Effect of Jewish Religious Observance on College Women's Perceptions of Marriage"
- 40. Eric Nathan Smith, "Gender and Occupation: More Than Meets the Eye"
- 41. **Joshua Swenson**, "Faith Development and Personality: Faith Development, Openness to Experience, and Ego Development"
- 44. **Phillip Boardman, Peter Contos,** and **Bryan Weber**, "Tax-Increment Financing Transparency Research and Recommendations for Chicago's Inspector General"
- 45. **Amanda Johnson** and **Alexandra Zayed**, "Ditching the Dome: The Minnesota Vikings' Pursuit of a New Stadium"
- 46. **Alok Nadig**, "From 'Gender-Inversion' to 'Object Choice': Reconciling Stratified Identities to Form a Coherent Political Gay Consciousness in India"
- 47. **Bill Russell**, "Dr. Wildcat: Explaining Decisions to Go to Graduate School after Northwestern"
- 48. **Kathleen Trocin**, "A Woman's Defense: Narratives of Suffering among Bolivian Women and Health Workers Surrounding Biomedical Contraceptive Use"
- 49. **Alexandra Wong**, "Looking Older Than Your Peers: Self-Perceived Relative Maturity and the Development of Risky Behavior in Adolescents from the Mobile Youth Survey"

50 Guide to Creative Arts Festival

So Creative Writing Showcase

4:00-5:15, Northwestern Room (202)

Moderator: Averill Curdy, English

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Jonathan Ayala

Faculty: Rachel Webster

The Difference the Sun Makes

I spent the better part of this school year working on a series of poems informed by the landscapes and history of West Texas. I used historical, as well as personal, perspectives to explore themes of family, place, and love.

Laura Jok

Faculty: Brian Bouldrey

A Sad and Serious Situation: A Portfolio of Fiction

Although the term "serious literature" relegates humor to a genre separate from the realistic literary novel, writers such as Muriel Spark, Evelyn Waugh, Iris Murdoch, Jane Austen, and Henry James have proven that effective satire requires acute observation of social truths. Humor, in these cases, does not ignore or distort realistic situations as much as it magnifies them with unflinching detail for the purpose of comedy. As I studied in the creative writing program and completed my senior thesis, I produced a portfolio of fiction that addresses this intersection of the funny and the true. In these stories, two aspiring opera singers compete and ineptly meddle with each other like characters in a light operetta-- and manage to do real harm. A middle-aged nurse with colon cancer, as she tries to celebrate her life, instead finds herself accosted by the banalities and absurdities of a Thanksgiving with her family. A young girl learns, during a class game in which the teacher affixes animal names to each student's back, that apt description can be a form of humor, cruelty, and true empathy. Finally, in the title novella, as her health and marriage deteriorate, a high school drama teacher engages in an affair with her student, through whom she can enter an adolescent mindset saturated with melodrama that treats every trivial and silly incident as a sad and serious situation.

Allison Manley

Faculty: Reginald Gibbons

The Guests

Some of the greatest mysteries are the personal lives of the ones closest to us. Although we tend to think that we know our close immediate family members well, we often forget that they have lives and experiences that they may not be interested in sharing. In my creative writing honors thesis, titled "The Guests," I sought to write about the relationships of three generations of women, and how those relationships are complicated by the past (and often unknown) experiences those women have lived. In addition to reading fiction writers such as Bellow and Munro for inspiration on writing about families, also I looked to "The Oxford Project" to inspire me to consider how people change over long periods of time. In the earliest stages of the draft, the focus of the story was on Claire Guest, a nineteen-year-old living at home for the summer before her sophomore year; as I continued to re-work the story, I switched the focus of the story to Marie Guest, Claire's mother, whose life as a teenager was much different than her daughter's. Most of the novella is set in the present-day, in which Mr. Pierce, a bizarre man who says he works with Mr. Guest, first comes to the Guests' home; interspersed through *that* narrative is the story of Marie's eventful visit to New York City as a teenager. "The Guests" explores unsatisfying relationships, the bonds and tensions between mothers and daughters, and the memories that we don't always want to remember.

Anna Miles

Faculty: David Catlin

It Was the Nightingale: Persephone's Play

"It Was the Nightingale" retells the Greek myth of Hades and Persephone using a combination of borrowed text from literature, poetry, and film including Peter Pan, Wuthering Heights, and poetry by Sylvia Plath and Louise Bogan, as well as original text by Anna Miles, demonstrating the strong presence of this myth in popular culture through the ages. The play focuses on themes present in the original myth such as transformation, growing up as a girl, and female sexual awakening. The play discusses an important but taboo topic about becoming a woman, and what it means to become an adult sexual being while still maintaining elements of one's childhood self. Persephone's mother Demeter and her friend, Helios the sun, try to convince Persephone to stay in her sheltered and safe childhood nursery, but Persephone desires more, and so when Hades sneaks into her bedroom one night she eagerly escapes with him to the dangerous underworld. Once there, she realizes she might be in over her head, and as she struggles to consolidate her desire for the safety of childhood and a mother's love (a part of her subconcsious personified onstage with the character "young Persephone") with her desire for an adult romance (personified by "queen Persephone"), she suffers from self-destructive behavior and complicated sexual encounters. Finally she develops a mature and loving relationship with Hades and recognizes her duty to both him and her mother. The play carries on the tradition of using myth to work through the unexplainable phenomena of life.

Ali Pechman

Faculty: Mary Kinzie

The Moon in the Room

My senior poetry thesis "The Moon in the Room," examines the effects of the phenomenological approaching the poet's world, inspired by Chinese storytelling traditions. The title comes from a story in Pu Songling's *Strange Stories from a Chinese Studio* called "The Taoist Priest of Mount Lao" in which a priest pastes a paper circle onto a wall, which then becomes a second moon that brings unforeseen visitors into the small study. Much like Wallace Stevens' "Planet on the Table" presents an object (a book of poems) which reorders life around it, so do the ghosts, foxes, and the paper moon of Pu's studio reconstruct the world they enter. Likewise, a child's world might too be recast after first learning about metaphor. The collection brings together poems inspired by these Chinese tales, translations of Li Po and the Midnight Songs, and poetry of my own experience.

So Student Film Festival-Feature Film

4:00-6:00, Evans Room (102)

Experience for Beginners By **Sarah Jane Inwards** and **Alec Ziff**

Applause for a Cause is a philanthropic film production company that writes, produces, edits, directs, and premieres a feature-length film (90 minutes or longer) each year, then donates all proceeds from the spring showings to that year's charity. This year Applause for a Cause produced *Experience for Beginners*, a dramedy about a woman mourning the death of her girlfriend, whose life is turned upside down when an old friend from high school, now pregnant, lands on her doorstep. Proceeds from the Applause for a Cause showings of *Experience for Beginners* went to the Make-A-Wish Foundation. Over 50 Northwestern students have worked on the film for the past 9 months, with jobs including writing, acting, production/filming, music composition, editing, publicity, beneficiary relations, and more. (Film length: 90 mins)

So Student Film Festival-Short Films

4:00-6:00, Wildcat Room (101)

Moderator: John Hass, Radio/Television/Film

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ExamiNation By Judy Suh

A short film about South Korea's notorious college entrance exam, Sooneung, and the lifestyle of students preparing for this exam.

Together in Winter By Catherine Merlo Produced by Nic Park, Emerson Nosek, and Maxwell Kelley

Together in Winter explores college feminism in a relational context. Taking place at Northwestern University in February 1974, the film follows two graduating seniors, Anne and Emily, as they struggle with the tension between family and career. As Emily chooses to follow the traditional path of marriage and family, Anne is forced to face her own insecurities and desires regarding her future. *Together in Winter* presents the fear and frustration that accompanies the end of one's college experience, while also highlighting feminist issues in a post *Roe v. Wade* society.

Student Film Festival-Short Films, continued

Dump the Dump

By

Emma Carlin and Elizabeth Miller

Near the intersection of Church St. and Dodge Ave. in Evanston, around the corner from Evanston Township High School, exists the Veolia Waste Transfer Station. Current law states that any sort of waste holding facility needs to be on at least 25 acres of land, but the Veolia Waste Transfer Station in western Evanston sits on a single acre in the middle of a residential area. It had been built before the current legislation was passed and continues to receive permits to operate as it always has. Our documentary *Dump the Dump* explores the ramifications of the dump on the community surrounding it, including its impact on economic development and quality of life in the area. Additionally, the station's existence and the citizens' efforts to get rid of it highlight a variety of racial issues, since the station physically divides the neighborhood along racial lines.

FMO: Legacy of X

By

Alice Li (Director), Yu Sun Chin (Editor), Ashley Mills (Cinemtographer), and Hannah Lin (Writer)

For Members Only has been on Northwestern University's campus for more than four decades, yet little is known about the student organization outside of the community it serves. Through examining the bursar's takeover and tracing the path of growth and change since 1968, the project aims to explore the past, present and future legacy of FMO and its niche within the Northwestern community, and encourage the ongoing dialogue surrounding cultural education, expression and diversity.

DIVA

By

Ashley Gates, Dan Q. Tham and Yoonie Yang

DIVA is a short documentary about the life and work of Rae Lewis-Thornton, a provocative Chicago-based AIDS activist. Rae has managed to make living with AIDS and being fabulous completely compatible. As she continues to inspire young people through social media, Rae reveals a part of herself not often seen in the public: her tremendous fortitude and wisdom.

After Dating for about 670 Days

By

Daniel Daehyun Oh (Director, Writer, Cinematographer, Editor) Kevin Changhan Lee (Writer), Tiffany Shinyoung Kim (Editor, Sound), and Jinah Park (Sound)

An ordinary college couple's relationship is challenged when certain suspicions and mistrust start to surface. The project was made independently outside of class during winter quarter 2012.

So Performing Arts Showcase

4:30-6:00, Louis Room (205)

ReFresH Dance Crew

Jun Sung Ahn, Jolo Aguilar, Tiffany Chang, Benedict Dungca, Shaina Fuller, Rachel Gladney, Cree Han, Linda Hong, Samuel Jang, Jenny Kim, Kerri Pang, Derek Suen, Hahnbi Sun, Brian Zhou, Daniel Zhou

ReFresH is a dance crew all about hip-hop. Whether it's taking it down to the underground street level b-boying, or hitting up the latest styles of choreographed hip-hop, you'll find it somewhere within ReFresH. We hope to inspire to seek a passion for the beat, just as we are continually inspired by those around us. Most of our performances can be found on our Youtube channel (www.youtube.com/user/refreshdancecrew).

Flamenco and Fusion

Sasha Bayan Khadivian, Sam Suggs, Gustavo Cortiñas, Michael Anderson, Justin Copeland, and Swen Hendrickson

Globalization has served a major role in effacing and obfuscating the boundaries between musical genres. The ease of distributing music digitally and the popularity of social media platforms like YouTube have shrunk the musical world by exposing listeners, performers, and composers to music otherwise outside their local earshot. While the borrowing of musical elements from foreign genres is not uncommon for most musical styles, the blurring of musical genres problematizes the traditional and pragmatic tendency to strictly categorize and compartmentalize styles. In the summer of 2009 I traveled to Seville to study how flamenco guitarists had begun to incorporate jazz vocabulary into their performances. Inspired by the flamenco guitarists' appropriation of Western genres, I began incorporating new sounds from foreign cultures into my own compositions. My presentation explores and exploits these stylistic boundaries by performing original compositions and arrangements of popular songs from the West. The performance showcases where the 80s rock of *The Police* meets a Latin Big Band, where the grunge of *Nirvana* meets Bossa Nova, and where flamenco fits into sacred and secular chamber music.

maeve & quinn: fusion/fission

Maris Maeve O'Tierney (maris maeve) and Bryce Quinn O'Tierney (bryce quinn)

A musical fusion of classical technique and folk/pop songwriting

maeve & quinn is a musical collaboration between identical twin sisters Maris Maeve O'Tierney (piano, guitar, vocals) and Bryce Quinn O'Tierney (violin, vocal harmonies). Born and raised in Anchorage, Alaska, Maris and Bryce are currently both dual degree students at Northwestern: Maris is pursuing degrees in vocal performance and political science, Bryce in violin performance and creative writing. Both Maris and Bryce have a strong background and training as classical musicians, continuing their classical studies at Northwestern. However, their classical technique also serves as a stepping-stone to other genres: they use their classical skill-set as a basis for innovation and improvisation, composing original music of folk/pop style. Maris recently released her second CD of original music, titled "room to build," in September 2011; she and Bryce collaborate and improvise on her song-writing, as well as compose together.

80 Performing Arts Showcase, continued

It's OK in the Day Britt Banaszynski

Faculty: Annie Beserra

What happens when research pursuits turn from questions of the world around us to questions of the world within us? "It's OK in the Day" is a selection from a series of performance pieces that emerged during my intensive process of an Honors Project in the School of Communication's Theatre and Dance Department. The project harnesses the research mode outlined in phenomenological hermeneutics for understanding how we as interpreters of performances as text make meaning of that text. My Honors Project, entitled "I am a Myth: Making Meaning through the Embodiment of Memory, Emotion and Story in Solo and Ensemble Theatre," aims to widen the boundaries of this research mode by engaging with inquiries about how I make meaning of my memories, emotions and stories as internal research texts. In my hermeneutic phenomenological research, I am the text from which I make meaning. My research extends to how this meaning emerges by interpretation through the creation of theatre pieces. These theatre pieces are new texts that that can be interpreted externally in public performance. "It's OK in the Day" contrasts the smooth, waltz-like quality of my everyday life as it is interrupted by the gripping anxiety of loneliness. This piece, like all of the work in my Honors Project, provides the space and time to create meanings of my memories, emotions and stories as text, while simultaneously allowing me the opportunity to make *meaning* of myself through the performance of new, choreographed text.

An Exploration of the Sonic Possibilities of the Saxophone

through performance of *Adria*, for two alto saxophones, by Christian Lauba **Daniel Arkfeld** and **Douglas Schneider**

The saxophone is an instrument with a sound palate rivaled by no other instrument in the Western tradition of classical concert music. In addition to an unparalleled dynamic and tone color range, the instrument can produce a variety of percussive sounds and multiphonics that go far beyond the traditional ideas of pitch production so pervasive in concert music. The saxophone can produce drum-like sounds through the use of a special tonguing technique, execute various pitched clicks and percussive effects, produce hundreds of simultaneously-sounding intervals through the use of nontraditional fingerings and multiphonic technique, and produce a diverse range of colors on normal pitched tones, from edgy and piercing to soft and muted. These sonic capabilities have only been pioneered by saxophonists and incorporated by composers in the last four decades and have just begun to create composed music that is truly idiomatic to the instrument. Although the saxophone is traditionally associated with jazz, it has a tremendous and unexploited potential as a concert instrument. For this reason, we have focused our performance studies on modes of sound production and performance that are truly idiomatic to the saxophone and aim to use these techniques expand the repertoire of the instrument. Our performance of Christian Lauba's Adria demonstrates one example of composed music utilizing these extended techniques in an idiomatic and performatively engaging way. It is a piece that requires the saxophone itself in order to be possible and demonstrates the performance techniques that we have developed during our studies at Northwestern.

So Performing Arts Showcase, continued

Fleur de Lune

Eric Seligman, Aaron Messing, Swen Hendrickson, and Steven White

Fleur de Lune is a combination of sounds from different cultures and worlds. The group unites trumpet and male falsetto melodies, the Hindustani Classical harmonium, the jazz sound of upright bass, and rhythms from the Peruvian cajon. The group can be found online at <u>FleurdeLune.bandcamp.com</u>.

Afterparty & Co.

Linda Hong, Jasmine Hubbard, Solbee Park, Hyejung Hazel Han, and Brian Zhou

with

Yunji Kang, Jenny Kim, Jessica J. Lee, Heejae Claire Kim, Yurie Kim, Jinhee Lily Baik, Chloe Kim, Stephanie Lee, Tiffany Chang, Hyerin Lee, Jamie Choi, Jinah Park, Jessica S. Lee, Kristin Kim, Kristin Chung, Kena Park, Cree Han, Dan Kim, Danny Cho,Jun Sung Ahn, and John Lee

Kpop is a fast growing musical genre that has not yet made a big impact on the Northwestern community, and we would like to change that. Korea has many pop groups that have successfully spread to other Asian countries and have just started to venture into America. We wish to spread knowledge and awareness of Korean pop culture here at Northwestern, and hope that the people will grow to love it as much as we do.

Treblemakers

Andrew Yoon, Jenn Kao, Yuchi Chiu, Kimberly Fang, Samantha Concepcion, MJ Kim, Jane Kim, Kingsley Leung, Sharon Yoo, Qing Chang, Geneve Ong, Sam Rong

Treblemakers is Northwestern's only East Asian-interest a cappella group. We were founded in 2004 and continue to be one of the fastest-growing groups on campus. From mainstream American pop to jazzy arrangements of Chinese ballads, we are always looking for something fresh to perform!

Ceremonial Sculpture: A Celebration of the Arts Charles Schultz and Johnson Brock

In a manner similar to the artists Gilbert and George, we wish to turn our bodies and our surroundings into sculpture. However, whereas this was a conceptual gesture on the part of Gilbert and George, we wish to explore the potential of the "living sculpture" medium to support a more abstract and mythological style. Our aim is primarily an aesthetic one. We are less concerned with commenting on art theory or politics, as much work in this genre does, and more concerned with producing a sensously pleasurable and emotionally stimulating work. We intend to achieve our goal through the use of methods taken from ritual, dance, stage design, and, of course, sculpture.
& Visual Arts Showcase All Day, Louis Room (205)

Ryan's Flowers by Adele Kuforiji

Ryan's Flower is a painting based off of a picture taken in Japan. Just like the photo, the painting attempts to resemble the camera affect, depth of field. The accompanying slideshow depicts the progression of the painting from background to foreground in order to better explain and give insight into the painting process of layering. In its current state the painting is lacking the final flower and essential details such as shadowing and other flower details.

London Apparatus by Judy Suh

This project is originally a video installation made and installed in London while I was studying abroad at the Slade School of Fine Art. The video was made with a camera contraption that combines a medium format analog camera and a digital point-and-shoot. The result is a strange and confusing, yet romanticized view of this tourist-filled city, representing the view of a temporary resident in London. The whole installation displays a meta-narrative or meta-function, as moving images keep feeding into multiple layers of lens and viewfinder/frame and it plays out. Please view the installation images as well as the video.

Prompted By A Fish by Judy Suh

Three oil paintings juxtaposed vertically to work together. Each painting was given a prompt to work from.

So Poster & Oral Presentation Abstracts

alphabetical by presenter's last name

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Isabel Abbott

Faculty: Frederick Northrup

Heavy Metal Leaching from Pottery Glazes Exposed to Food-Like Conditions

Pottery glazes are complex silicate structures with a mixture of metal oxides added to create the desired colors and other glaze properties. As many glazes contain the toxic heavy metals lead and cadmium, the FDA regulates the use of glazes containing these metals for functional pottery pieces designed for use with food or drink. There is growing concern about other metals such as barium which are potentially toxic and can leach into food but are not regulated. This project has studied the leaching of barium and other heavy metals from pottery glazes exposed to 4% acetic acid solutions. The dependence of metal leaching on the glaze recipe and other factors such as glaze firing conditions and glaze firing temperature has been investigated. Preliminary results suggest a surprisingly very limited dependence of leached metal concentration on metal composition in the glaze but a much stronger dependence on the use of oxidizing and reducing atmospheres during glaze firing. Results of these experiments will be presented for leaching of Ba, Sr, Cu, Co, Cr, Sn, Ti, Fe, Li, Mn, Ni and Zn. The use of other experimental techniques will be considered to explain these results.

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Aliza Abraham

Faculty: Malcolm MacIver

Characterizing the Sensory Input and Motor Output of Larval Zebrafish Prey Capture Behavior

The nervous system continues to be one of the most complicated and least understood biological systems. Yet it is also extremely important, allowing animals and people to take in information from their surroundings, decide what to do with the knowledge, consciously or unconsciously, and perform an action. The best way to understand such a complicated system is to start with a simplified version. The larval Zebrafish has a relatively basic nervous system, providing an ideal candidate for study. The larval Zebrafish also performs a very stereotypic behavior when it hunts. We set out to classify this behavior and understand how the visual stimuli in the world around the fish affect its behavior. We found that, as anticipated, the prey capture behavior has some very regular characteristics, but that the magnitude of these characteristics depends on the location of the prey. Also, the expression of many aspects depends on the availability of light, providing insight into how the Zebrafish receives information from the outside world. With the behavior so well characterized and a general understanding of how motor output relates to sensory input, we can begin to study the neural pathways that link the two. This information will put us one step closer to understanding the nervous system.

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Soo Ho Ahn and Hee Jae Choi

Faculty: Nina Kraus

Training and Its Positive Effects on Brainstem Processing in Older Adults

Older adults often have difficulty in background noise. This difficulty can occur even when hearing thresholds are normal, suggesting higher-level deficits in auditory processing. Neural synchrony and pitch tracking seem to have a correlation with accuracy of representation of stimuli at the subcortical auditory level as shown in previous studies. Using the plasticity of the brain and the descending auditory pathway as a driving force, a short-term auditory training was implemented to improve speech-in-noise (SIN) perception. Participants were placed in either Auditory Training group or Active Control (watching educational videos) group. Following eight weeks of auditory training, participants in Brain Fitness group illustrated significant improvement in both neural synchrony and pitch tracking, while those in Active Control group did not. These findings suggest the impact auditory training has on obtaining a more accurate neural representation of sound at the brainstem.

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Berkcan Akpinar

Faculty: Regan Thomson

Studies towards the Proposed Pharmacophore of Maoecrystal V

Recently, Zheng and co. discovered that diterpenoid natural product maoecrystal V demonstrates high levels of selective cytotoxicity $[IC_{50} = 60 \text{ nM}]$ towards the HeLa cell line derived from cervical cancer. Similar to other natural products utilized in medicine, maoecrystal V's desirable cytotoxicity suggests it is a viable candidate for chemotherapeutic development. Since there have been no formal structure-activity relationship studies performed on this compound, an identification of the bioactive portion, the pharmacophore, is crucial to streamlining potential drug development. We propose that the portion of the compound responsible for biological activity is the bicyclic carbon core containing the electrophilic enone functional group. Here, we report progress towards the synthesis of the proposed pharmacophore achieved through various high-yielding transformations starting from commercially available mono-protected 1,4-diketocyclohexane.

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Neha Awati

Faculty: James Booth

Multimodal Integration and Auditory Modulation in Fluent Whole-Word Reading

Multimodal cognitive processes are ubiquitous, involving integration of information from multiple senses. Fluent whole word reading is dependent on both a learned association between phonemes and an abstract orthography. Therefore, reading is one such process that requires integration of input from both auditory and visual processing areas. Studies that have more closely examined the multisensory nature of reading have attempted to identify and clarify the network and functionality of the brain regions involved in multisensory language processing. Research in the field has shown that manipulating the congruency of letter-phoneme identity between simultaneously presented letters and speech sounds modulates activity in parts of primary auditory cortex. This suggests that the aforementioned regions thought to be specialized for processing phonology are in fact sensitive visual orthographic input. In parallel, a region in the left occipito-temporal cortex known as the "visual word form area" (VWFA) is specific for the orthographic processing of letter strings during whole word reading, yet studies have yet to show crossmodal sensitivity (i.e. auditory modulation) in this visual processing region. In the present study, we test whether analogous congruency effects appear at the whole word level in the VWFA and also if they develop with reading skill. Eighteen typically developing children made phonological judgments to two sequentially presented words in one of three modality conditions. Results showed increased pattern similarity in the VWFA between congruent and incongruent stimuli in a crossmodal condition, implicating the VWFA in multimodal lexical processing.

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Karen Badawi and Brandon DeLallo

Faculty: Donald Gordon

City of Chicago's Office of Budget and Management, Final Recommendations

Our research team conducted an analysis of the Office of Budget and Management (OBM) during the Winter Quarter of 2012 in a joint collaboration with the Chicago Inspector General's Office via a pilot initiated by Donald Gordon of Northwestern University. A comprehensive review entailed analysis of currently available budgeting information provided on the OBM's website, linked sources, social media platforms, and aggregated economic data posted on multiple City of Chicago websites. Chicago's 2012 Budget Overview revealed a \$635.7M financial deficit. Findings indicate that all of the city's departments are not included in the complete budget. If they were, the deficit amount could actually double the disclosed figure. The fact-finding was performed in order to identify innovative ways to leverage technological advances to convey meaningful financial data to various Chicago stakeholders. Properly implementing technology to convey complex fiscal data to the average citizen would increase understanding and interest. Our information concludes that Mayor Emanuel's administration is initiating groundbreaking strides in an effort to promote efficiency, protect taxpayers, and make the best use of resources, as expressed by the department's mission statement but changes can continue to be implemented. Presenting information on social media and through government websites in a clear manner demonstrates that necessary initial exposure, of the government, is an effort to engage the citizenry and precursory transparency. Through easy to read graphs, maps, social media and soliciting website user feedback for improvement, the initiative and certainly Chicago's "Open Data" website creates buzz using 21st century tools. The research team also included Matt Marcus.

Alexandra Baleanu

Faculty: Mark Witte

Emotions and Suboptimal Decision Making: I Know I'm Wrong, So What?

Evidence exists that people make decisions that are inconsistent with the concept of expected utility maximization. Repeatedly, people choose options that are "paradoxical" from a rational agent's perspective such as investing in very risky ventures that have low returns. This study explores the emotional drivers of deviations from rational choice under risk in an experimental setting. It focuses particularly on suboptimal decisions when subjects actively choose to invest in assets after receiving additional information and reporting updated belief that their choices have low probabilities of returning high outcomes. Two main mechanisms are explored: anticipatory feelings of regret for missed opportunities of high gains and attachment to initial choices. Subjects take risky investments because they derive additional utility from attaining high gains and anticipate experiencing high regret from forgoing opportunities to win high gains. Also, once subjects make a risky investment, they are more likely to continue making the same decisions going forward, regardless of any signals they receive about the choices. Previous choices have higher impact on decisions about current investments than additional information about the assets and switching from the initial choice becomes less frequent over time, regardless of newly acquired information. These results imply that emotional responses can induce people to make suboptimal decisions even when they report low probabilities of high outcomes.

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Samuel Barker

Faculty: Scott Paulin

"The Number One (Digital) Princess in the World": VOCALOID, Hatsune Miku, and the Blending of Humanity and Technology

Vocoder and Auto-Tune technology is both revered and reviled; while it gives music producers the opportunity to creatively manipulate the human voice, it is also widely criticized for both ruining the verity that the listener is hearing the singer's actual voice and for blending the human with the technological to produce a sound that does not fit comfortably in either category. However, there are other technologies at work that split the divide between human and digital in an entirely different way. Enter VOCALOID, software developed by Yamaha that simulates a human voice and gives users an opportunity to create their own fully vocalized compositions. Through Yamaha's partnership with Crypton, they created various cartoon personas based on different VOCALOID sound samples, the most popular of these personas being a sixteen-year-old girl with teal pigtails by the name of Hatsune Miku. Not only does she have a cult following in Japan with multiple popular hits, she also performs live in concert settings in front of thousands of fans. While software such as Auto Tune is stigmatized for its usage on vocalists, programs such as VOCALOID show that the human voice can be manipulated to the point that it transcends the categories of "human" and "digital" and creates a new category altogether. This research delves into the question of Hatsune Miku's "humanity," comparing the lyrics and musicality of her songs as well as her human-like choreography to her impossibly fast rhythmic ability and technical aptitude. It also analyzes the

instances in which these two aspects come in direct conflict with each other. Ultimately, it contributes to current musicological dialogues on the role of technology in the distinctly human phenomenon of music.

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Taylor Barrett

Faculty: Karrie Snyder

Female Comedians: Negotiating the Gender Bias in Improvisational Comedy

Since improvisational ("improv") comedy emerged in Chicago in the early 1950s, men have traditionally dominated the medium. Though today there are certainly more women participating in the art form than in the past, men continue to represent a disproportionately higher percentage of performers and directors. This study examines how women at two different stages of their improv careers – "students" at the college level and "professionals" working in Chicago, Illinois - perceive biased gender treatment and react to potential discrimination. For the ethnography, 24 women were interviewed including nine professionals (Mage = 34.6, SDage = 8.6), fourteen students (Mage = 20.4, SDage = 1.6), and one woman who occupied an "intermediary status" having just graduated from college (Mage = 24). The researcher also observed these women as they performed on stage and focused on how they handled moments of marginalization. The findings suggest that "professional" women improvisers are more adept at handling discrimination because they employ more effective "coping mechanisms." In general, an increase in age and improv training is associated with a decrease in a concern about biased gender treatment.

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Dana Behnke

Faculty: Henry Binford

Competing for the Masses: The Morality Problem of Chicago Amusement Parks in the Early Twentieth Century

In the early twentieth century, Chicago's first amusement parks seemed to have transcended rigid class boundaries with both middle-class and working-class patrons freely intermingling within the amusement park walls. Despite the parks' popularity, reformers anguished over the availability of alcohol, the prevalence of gambling, and the advertisement of scantily clad women in sideshows. Critics worried that the amusement park experience promoted loose morals that could extend beyond the gates of the parks and into society at large. By examining newspaper articles and archival sources, I explore how Chicagoans shaped their ideas about public morality given this new form of mass entertainment. I argue that throughout the years 1904-1917 Chicago amusement park critics, managers, and, implicitly, the patrons of the parks themselves actively redefined what constituted "moral" amusement. By participating in a public discourse about the appropriateness of amusement parks, these actors continually wrestled with the notion that certain forms of entertainment were inherently immoral. The process of defining what constituted respectable entertainment both

questioned and reaffirmed conventional class categories while eventually broadening the scope of permissible public behavior.

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Kaasha Benjamin

Faculty: Donald Gordon

Chicago Police Department- Chicago Alternative Policing Strategy (CAPS): Recommendations for Transparency and Government Accountability

In collaboration with the Chicago Inspector General's Office and its Open Chicago initiative, our group worked directly with the IGO staff to enhance transparency in the city of Chicago government. The Open Chicago initiative was designed to increase the understanding of city government for all stakeholders (city residents, the media, even members of the City Council), and to promote efficiency, effectiveness and integrity in the city's operations that can come only from accountability achieved through meaningful public scrutiny. For our project, we selected the Chicago Police Department's Chicago Alternative Policing Strategy program (CAPS) and examined its efficiency, public presence, and effectiveness in curbing crime in Chicago communities. During the course of our research and analysis of CAPS program, we identified and evaluated three of its key elements according to their effectiveness in preventing crime in Chicago communities. These three elements were expanded police presence, support from other city agencies, and community involvement. While some areas of the program exhibited strength in accessibility and presence for citizens, others lacked overall organization and availability of information necessary to be effective. Because of this, we have developed a list of recommendations that we feel will add clarity to the CAPS program and its initiatives. The recommendations have been organized according to the element of the CAPS program that they aim to address. Also, recommendations for creation of a homepage for the program will comprise the beginning of our analysis. The institution of these recommendations by the CAPS program will not only increase the effectiveness of the program's mission, but demonstrate the dedication of the Chicago Police Department towards creating a transparent relationship with the citizens of Chicago. Our final project has now been made available on the IGO's Open Chicago website and is accessible to the general public.

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Grace G. Berman

Faculty: Eli J. Finkel

Getting to Know You: Familiarity as a Predictor of Liking

The purpose of this study was to investigate whether familiarity or ambiguity breeds liking in initial interactions. Most previous research has suggested that familiarity is a predictor of attraction, but a recent controversial study by Norton, Frost and Ariely (2007) demonstrated the opposite. We predicted that in using valid mediums for conveying information about targets (Facebook and video), familiarity would lead to liking. We believe that familiarity produces feelings of comfort and safety, whereas ambiguity creates feelings of uncertainty and wariness. Results revealed that having

more information about targets causes participants to like them more, and that participants' perceived knowledge of the targets is a mediating variable. Contrary to the results of Norton et al. but consistent with previous literature, familiarity breeds liking.

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Phillip Boardman, Peter Contos, and Bryan Weber

Faculty: Donald Gordon

Tax-Increment Financing Transparency Research and Recommendations for Chicago's Inspector General

Chicago's Tax Increment Financing (TIF) program has frequently come under attack for being a form of shadow budget in which tax money is spent with little public input. In recent years, the new push for transparency in local government has begun to shed more light on TIF financing. Our team analyzed the current state of transparency in the Tax Increment Financing administration by the Chicago Department of Housing and Economic Development. We reviewed government websites as well as reports from both public and private watchdog groups in order to determine what data is currently available and how it meets the transparency guidelines of being accessible, comprehensible and enticing. As we researched the available data on TIFs, we found that while there have been improvements in recent years, there is still significant information that is missing, vague, and difficult to find and understand. Since much of the data that does exist is displayed in large awkward PDF files, we determined that moving data to a searchable database, providing visual representations such as charts and graphs, and presenting metrics in a performance dashboard would greatly enhance citizen engagement. Much public TIF data still lacks necessary detail, and in the case of infrastructure projects is practically nonexistent, so it is hoped that increasing transparency will ultimately shine light on the shadow budget. Our final report was submitted to the Chicago Inspector General's Office as part of their Open Chicago Initiative.

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Maria Brackin

Faculty: Jennifer Lackey

Trust and Epistemology: Are There Conflicting Demands for the Good Friend and the Rational Epistemic Agent?

My senior thesis explores how trust can affect our rationality, asking whether we can both trust and maintain epistemic rationality in friendships. I define trusting friendships and then compare two contrasting views about trust as they apply to this definition. The first view, Strict Reductionism (SR), holds that a trusting friendship provides us with no special reasons to trust, is rational if based on evidence, and applies to particular skills, behaviors, or situations. The only difference provided by friendship is that we trust more as a result of more evidence about our friends. The second view, TENSION, holds that a trusting friendship provides special reasons for trust, does not conform to evidence, and allows for general trust. On this view, there is a tension between the demands of the good friend and of the good epistemic agent; therefore, one cannot always simultaneously be a good

friend and a rational epistemic agent. I argue against TENSION because it allows dangerous irrational behavior and does not adequately motivate demands for friendship. However, I also argue against SR as overly restricting and an inadequate description of friendship. I advocate a third view, Weak Reductionism (WR), which holds that a trusting friendship provides special reasons for trust, is rational if grounded in evidence, and allows for general trust. This view incorporates the idea that friendship is valued and that we can trust our friends in general, while providing restrictions that prevent the negative consequences of misplaced trust.

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Rachel Cackler

Faculty: Richard Zinbarg

Information, Not Detection, Bias in Socially Anxious Individuals

The current study examined the reactions of high and low socially anxious individuals to emotionally valenced film clips using a signal detection theory approach. Participants viewed four film clips of differing emotional valence in random order. Each scene was roughly thirty seconds long, and the clip ended before the characters reached a resolution, leaving the ending ambiguous. Immediately after viewing each video clip, participants responded to a multiple choice question that asked them to forecast the scene's ending. They also rated the emotional intensity of the interaction using a 1 (strongly disagree) to 7 (strongly agree) Likert scale for several emotions. Following these ratings, participants continued to the next clip until they had viewed and responded to all four video clips. After participants had viewed all four video clips and completed the associated multiple choice response and ratings, they were presented with a recognition task that included words that were spoken by characters in all four video clips (social threat, positive, and neutral words) as well as valence-matched words that did not appear in the clips. The selected words were matched on frequency of usage in English and average word length. When examining response bias, or ß, there was a significant three way interaction between group (high or low socially anxious), scene type (happy, sad, angry, embarrassing) and word type (negative or positive) (F(1, 65) = 2.85, p = .03). Follow-up tests revealed that this interaction arose from high socially anxious individuals using a more liberal response criterion (B=-.23) for recognizing negative words for happy scenes than low socially anxious people (B=.25). However, when examining sensitivity, or d', there were no significant main effects or interactions. Thus, there was no evidence that the two groups significantly differ in terms of sensitivity (d' scores) but do there was evidence that they differ on response bias for negative words in response to a happy scene. Moreover, high socially anxious participants rated happy scenes as significantly sadder than low anxious participants. They also forecast more negative endings to happy scenes than low socially anxious individuals; however, this effect only approached significance F(1, 65) = 3.59, p = .06). Taken together, this suggests that as opposed to a difference in their ability to detect threat words or possessing a general bias (they just tend to say "yes" more) for negative information socially anxious individuals may be more willing to endorse negative information in inappropriate contexts (i.e. low threat situations).

Michael Campos

Faculty: Kimberly Gray and Justin Notestein

Titania-Silica Nanocomposites for Solar Fuel Production: Design, Synthesis, and Characterization

Photocatalysis on the surface of semiconductors, such as titanium dioxide (titania), holds promise for the future of solar energy capture and storage. In photocatalytic processes such as the reduction of carbon dioxide, tetrahedrally-coordinated Ti(IV) sites located at the interfaces between solid phases are more active than the octahedrally-coordinated Ti(IV) in bulk titania. It is not clear exactly what roles these sites play, however. Do these sites trap charges and facilitate electron transfer to adsorbed carbon dioxide? Do they themselves serve as binding sites for carbon dioxide? Do they do both? To answer these questions, the known templating effects of (tetrahedrally-coordinated) silica were exploited in order to synthesize and investigate several classes of novel under-coordinated titania-silica nanocomposites. These materials were targeted to possess varying degrees of atomic precision. Additionally, several previously established titania-silica photocatalysts were prepared via sol-gel methods and quantitatively compared to these novel materials. Band gap measurements were obtained via diffuse-reflectance UV-vis (DRUV-vis) spectroscopy, and photocatalytic ability was screened in both solution phase photo-oxidations of benzyl alcohol and gas-phase photoreductions of carbon dioxide. Preliminary results show progress toward successful synthetic methodologies, and preliminary photocatalytic data corroborate this.

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David Caratelli

Faculty: André Gouvêa

Determining the Neutrino Mass Hierarchy through Long-Baseline Reactor Experiments

Neutrinos are very elusive particles and one of the fundamental components of matter. There are three types of neutrinos, each one associated to a different charged particle (the electron, muon, and tau). Over the past couple of decades neutrinos have become the focus of many experiments that aim at uncovering new physics beyond the standard model of particle physics. After establishing that neutrinos have mass (a very small one) and can spontaneously oscillate from one type to another, one of the puzzles we face is figuring out how the masses of the three neutrinos are ordered. Solving this problem can help us better understand the fundamental structure of matter and would have implications for our theories of cosmology. Neutrinos are produced in great amounts by nuclear reactors as fission products. Here we present a study of simulated experiments that would use the detected energy-dependent neutrino flux from reactors to determine the neutrino mass ordering. A study using different simulated experimental setups has been conducted allowing for variation both in the characteristics of the detector and the parameters that characterize neutrino oscillations. We find that, even though there are some nontrivial technical challenges, an experiment sensitive to the mass hierarchy could be designed.

Alice Carter

Faculty: Patricia Beddows

Vista Alegre - A Story of Environmental Change

The Maya archeological site of Vista Alegre is located on the north coast of the Yucatan Peninsula. It is a port city that was occupied by Maya several times over the past two thousand years. During this period, global sea level rose 1-2 meters - enough to significantly change the northern coastline of the peninsula. Sediment cores taken from the coastal environments around Vista Alegre in May 2011 contain a detailed record of the climate, ecology and hydrology of the system. This project aims to reconstruct the dynamic changes in the environment caused by rising sea level and to use this knowledge to contextualize the archeological data from the site. The cores were analyzed for lithology, organic matter and calcium carbonate content, and stable oxygen and carbon isotopes. Radiocarbon dates from the base of these cores are as old as 2,500 years BP; they thus provide a full record of the time of site occupation. Visible horizons in the cores are confirmed by chemical data and show transitions between different types of environments that are indicative of long-term changes in salinity and mangrove productivity. This area shows a huge amount of seasonality in the water chemistry from the wet season to the dry season. In May, all of the water was warm and hypersaline whereas in December, the water was cooler and much fresher. This indicates that fresh water may have been available to the Maya at springs for at least part of the year, especially when sea level was lower.

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John Castro

Faculty: Emily Maguire

Operación Pedro Pan Revisited: Examining Depictions from Granma to Government Agencies

Operation Peter Pan (also known as Operación Pedro Pan) was a covert US program that brought over 14,000 Cuban children whose parents feared indoctrination and possible loss of their children at the hands of the Fidel Castro regime to the United States between 1960 and 1962 through an elaborate system of visa waivers under the pretense of attending school abroad. The program aimed to have these children temporarily live with volunteer foster families or at group homes until Castro's removal from power, after which they would return. Unfortunately, as the program continued to send children to the United States, the Cuban Missile Crisis cut off immigration between the two countries. This led to a shift in program aims, attempting to take care of the children in the now indefinite period before they could be reunited with their families. Now, fifty years later, research by former Pedro Pan children has brought renewed focus to the program. In response, the current-day US and Cuba have taken radically different stances on principal actors involved, long-term intentions, and the ethical character of this largely overlooked chapter in US/Cuba relations. This project seeks to clarify what truly occurred and assemble the reactions of those involved in all capacities in this unique chapter in the US's immigrant history.

Jessica I. Chen, Frank D. Cummins, Brett A. Horin, and Meghan McNulty

Faculty: Scott Cyphers

Design for a Health Center in El Canton, Honduras

This project is the Northwestern University chapter of Global Architecture Brigades' entry in a Global Brigades-affiliated design competition for a health center in El Canton, Honduras. Global Brigades is an international nonprofit organization that brings college student volunteers to less developed countries in order to work on sustainable development projects. El Canton is a rural, sparsely populated community in the mountains of southern Honduras. El Canton is so isolated from modern medical services that its community members must walk over two and a half miles to reach the nearest health facility. The guidelines for this design, as put forth by the Global Brigades program, stipulated that the final design must utilize local materials and construction practices, and contain a waiting room, two closets, an office, and two examination rooms. The design team first approached this task by researching sustainable construction practices in order to both improve the standard of living and respect the local culture. Further research revealed that the hilly site, the community's limited access to construction materials, and the subtropical climate created significant challenges for which design team had to find creative solutions. The final design utilizes passive lighting and cooling systems, a rainwater collection system, and local materials, making it simultaneously aesthetically pleasing and economically, socially, and environmentally sustainable. Members of the community judged this competition, and this design placed third out of fifteen entries.

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Sarah Crocker

Faculty: Kasey Evans

John Donne's Sexual Sacrament: Holy Social and Sexual Intercourse

Many critics have examined how John Donne blasphemously conflated religion and sex in his verse; in this project I posit a new reading to demonstrate how he used the historically debated sacrament of the Eucharist as a model on which to base his understanding of social and sexual intercourse as sacramental. Donne asserted that communal prayer, a type of social intercourse, could perform miracles like those of Christ, healing a man in sickness or imparting Christ-like divinity to those who participated in collective prayer. Donne proposed that communal prayer, like the Eucharist, provided participants an avenue to the divine realm, while also enacting a corporeal transformation in which they gained bodily divinity. He took his idea of the social sacrament a step further in privileging sexual intercourse as a social sacrament. He applied his sacramental ideology in his erotic verse by equating the speaker and his lover with the vehicles of the Eucharist, becoming divine elements of the sexual sacrament. Donne advocated many profane acts in his secular poems that sanctified sexual intercourse, endorsing sexual intercourse outside of marriage as well as more scandalous relations such as polygamy; in every instance the speaker argues that such sex does not debase the lovers, but in fact helps them achieve God's grace in this life and the next. By reading Donne's sermons, Devotions and secular verse as advancing two created sacraments, one understands Donne not just as a risqué theologian and poet, but also as a reformer of the Anglican Church.

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Nirmit Desai, Kristin Palarz, and Michael Sherer

Faculty: John Mordacq

Northwestern iGEM Team 2011 - Pseudomonas aeruginosa Biosensor

Pseudomonas aeruginosa is an opportunistic pathogen commonly found in immunocompromised patients. In addition to being the primary cause of lung infections in cystic fibrosis patients, many severe nosocomial infections can be attributed to *P. aeruginosa*. Currently, the standard detection method requires a potential sample to be grown overnight and then screened for the pathogen of interest. We have engineered an *E. coli*-based biosensor capable of detecting the presence of autoinducer molecules unique to *P. aeruginosa*. Thus, our system provides a faster detection method without sacrificing reliability or experimental resolution. Quorum sensing in *P. aeruginosa* is a complex hierarchy that governs the expression of numerous virulence genes. To realize our objective, we harnessed the native cell signaling and quorum sensing machinery of *P. aeruginosa*. We have thus created a novel, inexpensive biosensor capable of detecting the presence of *P. aeruginosa* both quickly and effectively.

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Alina Dunbar

Faculty: Jeff Rice

Competing Narratives on HIV/AIDS in South Africa: How Journalists and Healthcare Workers Perceive the Epidemic

A wide of range of explanations has been offered to explicate why the HIV/AIDS crisis in the African continent, and in South Africa in particular, is of such great magnitude. Even between journalists and heath care workers in the same country, there are different ideas about the best way to tackle the problem. For two months in 2011, from mid-June to mid-August, I traveled to the major cities within South Africa to interview health reporters and doctors in order to ascertain their general opinions about the HIV/AIDS crisis that continues to ravage the country. While I found that South African journalists and doctors do have some varying opinions, the major implication drawn from this study is that the number of explanations offered is overwhelming. These explanations are worked into what I call "narratives" of HIV/AIDS. In this talk, I will highlight three of the most important narratives present in South Africa at this time: 1). the professional narrative espoused by the journalists and health care workers I interviewed; 2). the popular narrative as reflected in the South African media, and 3). the street narrative that is formulated and disseminated on the ground. I argue that articulation and reconciliation of these narratives is necessary if government officials, HIV/AIDS activists, and professional workers in South Africa hope to halt the spread of the disease through HIV/AIDS awareness, treatment, and prevention.

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Kevin Echavarria

Faculty: John Cutler

"What Matter Who's Speaking?" The Authorial Figure in Junot Díaz's *The Brief Wondrous Life of Oscar Wao*

Roland Barthes "The Death of the Author" and Michel Foucault's "What is an Author" are two seminal texts in contemporary postmodern literary theory. Ushering in a new mode of thinking with regards to literary criticism, these essays call for the elimination of the author in a literary work's consideration while promoting the power of the reader in a work's analysis. This mode of thought, however, is not so simply applied. What about when the narrative voice of a text is so essential to a text that it seems the authorial figure necessitates consideration, bringing it back to relevancy? One such novel with a strong narrative voice is Junot Díaz's extremely self-referential, diversely allusive work, *The Brief Wondrous Life of Oscar Wao*. The novel uses the plight of its eponymous Dominican-American sci-fi nerd as a way of framing the history of the Dominican Republic, its diasporic people, and the harsh reality of realizing the "American dream." Using Barthes and Foucault as a departure point for analysis of the novel, I seek to re-imagine the author function as a more complex interaction between the author and the reader, in which both are empowered and returned to relevance, implying that their relationship is not merely a zero-sum game. Rather, in a novel such as *The Brief Wondrous Life of Oscar Wao* with an extremely powerful narrative presence, the two figures of Reader and Author work together to convey the novel's message.

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Alex Entz and Sam Houskeeper

Faculty: Hendrik Spruyt

The Chicago Public Schools System: Renaissance 2010

Politics & Policy decided to examine the Chicago Public School System in order to have an in depth case study of one of America's public school districts, especially one that is known for low performance. We undertook this project because of the importance of the American school system to our nation's economy and culture, as well its relevance in the political realm. Once we began examination of the district in recent years, we began to focus on Renaissance 2010, a project to build or remake 100 new Chicago public schools by 2010. Currently, the schools created in the project show no great improvement in test scores or otherwise. P&P researched Renaissance 2010 schools and found a wide variance of performance often characterized by selective enrollment charter schools at the top and traditional public schools at the bottom, in the end yielding the same average performance as the CPS did before. Our conclusion: instead of improving public schools on the neighborhood level, the program often leaned towards school construction, which did not necessarily improve the school atmosphere, and a focus on selective enrollment charter or magnet schools, which became high achieving and yet did not significantly raise the district mean or help the average student.

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Ann Fefferman

Faculty: Carolyn Chen

A Suspension of Reality: University Campus Culture and Hooking Up

In recent years, a substantial amount of research has focused on understanding a particular contemporary practice of college-age sexuality, encompassed in the term "hookup culture." This cultural script for undergraduate college students entails short term, noncommittal, casual sexual encounters. This study seeks to understand how and why the hookup culture pervades American universities and colleges despite the research indicating that casual sexual activity frequently results in negative psychological consequences. Results from personal, in-depth interviews with Northwestern undergraduates suggest that students are overall unhappy with the hookup culture at Northwestern and want more committed romantic relationships instead of the casual sexual encounters that are so prevalent on American university and college campuses today. Despite these negative attitudes, the present research suggests that there exist social pressures leading students to follow a particular cultural script associated with sexuality during the college years in the U.S. Some forms of pressure are common to men and women, others vary by gender. Together these pressures ultimately maintain the hookup culture. Most students conform to the cultural script and adapt to college life. However, there are students who hold conservative religious values and exclude themselves from Northwestern Greek-affiliated activities, and they thereby resist this culture script.

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Betsy Feuerstein

Faculty: Hannah Feldman

Dakar Graffiti: The Discourse of the Street

Political graffiti exists throughout the world, across visual cultures and political situations. In the past year alone, overtly political graffiti has emerged across the Arab world during the "Arab Spring," and across the West through the "Occupy" movements. However, we do not have much documentation of this phenomenon and therefore have little understanding of graffiti occurs in cities, in what socio-political contexts, using which visual tools, and containing which messages. Without this information, we cannot form a comprehensive understanding of why people create political graffiti - and what that graffiti reflects about that state's political situation. This project develops a methodology with which to assess graffiti's relationship to a country's politics and aesthetic culture, drawing on both Art History and Political Science approaches. Based on the author's original research on political graffiti in Dakar, Senegal, and an analysis of historical precedents for such expression, this paper argues that the prevalence of graffiti in Dakar leading up to the 2012 Senegalese presidential election reflected a broad civic claim to the viability of political expression in public space. This visual, civic intervention in public space built on a long history of such interventions against authoritarianism in Dakar. The 2012 electoral graffiti there extended this history but also added to it with competing voices that represented an array of political views. Official political organizations engaged in this discourse as well, using similar graffiti forms to

promote their own candidates, while submitting them to contention in public space. The prevalence of these institutions vying with each other demonstrates the centrality of urban space in fostering the electoral process, despite the regime's attempts to threaten Senegalese democracy.

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Sarah Freeman

Faculty: Galya Ruffer

The "Post-Conflict" Problem: Transitional Failures from Emergency Relief to Sustainable Development for Internally Displaced Persons and the Need for Solutions

Internally displaced persons (IDPs) require a reconceptualization of existing assistance structures than the refugee-based framework currently in operation for such populations. Such a framework that of the "relief-development continuum" - operates on certain assumptions - namely, that both conflict and displacement end at distinct points in time (demarcated by the term "post-conflict") as well as older notions of sovereignty - that do not hold for situations of internal displacement, perpetuating the division between humanitarian aid and development. As opposed to refugees, IDPs present a much more complex context by never crossing international borders, there being no consensus as to whether displacement ends, and the incredible variance of contextual needs within displaced communities. The flow of aid within such assistance structures, as well as the treatment of IDPs as emergency situations, demonstrates and (re)produces the bifurcated nature of assistance. The employment of "post-conflict" rhetoric attempts to fuse such a division, yet only serves to obscure micro-level realities and reify the broken model on the ground. To demonstrate the continued use (and failure) of the broken continuum at the micro-level, I conducted 42 interviews with both aid organizations and residents of former-IDP camps on the ground in Gulu, Uganda, allowing me to map the organizational network in the region over time. Through this analysis, I will demonstrate that the continuum utilized in practice is no longer adequate for the complexity of protracted IDP situations, preventing the long-term needs of such populations from being adequately addressed.

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Kyle Frost

Faculty: Michael Rakowitz

Bringing Outsider Art into the Gallery

Autism Spectrum Disorder (ASD) is a developmental disorder that appears in the first three years of life, impairing development of social and communication skills. Children with ASD tend to have difficulties with pretend play, social interactions, and verbal and nonverbal communication. I am interested in raising awareness for the disorder, encouraging alternative modes of communication in the children who have it, and building an area of self-esteem and social engagement for their benefit. Art can act as an alternative form of communication and help to foster imagination in children who have difficulty with communication and thinking creatively. Use of art as nonverbal expression encourages children with ASD to communicate and represent their experiences. For this project, I

designed and facilitated art projects with Autistic children attending programs at Have Dreams, a local Autism resource center. The project culminated in an exhibition and gallery opening at the Evanston Art Center, consisting of the works created by the children at Have Dreams. This exhibition was documented with an exhibition book with selected works, projects, and goals. With this project, I hoped to engage and inform the community by bringing "Outsider Art" into the gallery, and organizing and hosting an event that brings together diverse groups of people to appreciate the artistic accomplishments of the students at Have Dreams. Too often, developmental disorders can be stigmatized; this project aimed to empower children with ASD, and to help integrate them into the community by bringing their outsider art to the foreground.

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Paul Geringer

Faculty: Melville Ulmer

Baryon Fraction and Mass Density Profiling of the Perseus Galaxy Cluster Utilizing XMM-Newton Observations

Clusters of galaxies are massive structures containing approximately 10¹⁵ solar masses. The mass contained in clusters provided the first hints of the existence of dark matter. The hot intra-cluster medium (ICM), which is a gas with a temperature of 10⁸ Kelvin, is easily detected by X-Ray telescopes. Of particular interest is the close Perseus galaxy cluster, one of the brightest X-Ray emitting galaxy clusters in the sky. Due to the large angular extent of the cluster, background noise subtraction is particularly challenging, and has yet to be completed using the full set of Perseus observations from the XMM-Newton X-Ray Telescope. Detailed temperature and abundance radial profile maps have revealed a significant lack of homogeneity within the cluster. Previous surveys of Perseus with the Suzaku telescope, which has a worse angular resolution and less light collecting area than XMM-Newton, revealed over-densities of X-Ray emission. These results provide evidence that the baryon fraction exceeds the universal average, which we had initially hoped to study. We have yet to confirm or deny the existence of clumping in these regions, which could explain such overabundance of X-Ray emission. This project offers a framework of efficient, automated processing techniques to "clean" images of noise from the mechanics of the telescope, background radiation from local sources such as the solar wind, and more distant sources such as background AGN. The galaxy cluster studied in this project contains high levels of contamination due to its line-of-sight position close to the dust- and star-filled arms of the Milky Way galaxy. Rigorous spectral model fitting of the cluster employ multiple parameters dedicated to accounting for these contaminations. The framework created from this analysis technique will provide the opportunity to expand this analysis to any nearby galaxy cluster, such as the Virgo, Coma, and Ophiuchus Clusters. This research should provide significant insight into how matter, both baryonic and dark matter, is distributed throughout diffuse cluster systems, as well as give clues to the origin of the ICM.

Jacklyn Giannitrapani

Faculty: Elisa Baena

Breaking the Barriers to Regularization: The Informal Real Estate Market in the Argentine Shantytown Villa 31

Based on data collected during field research in Buenos Aires the summer of 2011, Melissa Rothman and I sought to understand the factors that have prevented the permanent and urban shantytown Villa 31 from formally incorporating into the larger city. Located in the wealthy and centrally located Retiro neighborhood of cosmopolitan Buenos Aires, Villa 31 has resisted eradication efforts and retained its coveted position in the city for over 80 years. Despite past regularization laws, the shantytown has yet to be incorporated into Buenos Aires as a formal neighborhood. My research concludes that a lucrative informal real estate market has led to disunification within Villa 31 and has inhibited the residents' ability to effectively mobilize and pressure the government to follow through with regularization plans.

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Nicolas Grosso

Faculty: Justin Notestein

Shape Selective Oxidation of Alcohols by Nanocavity Containing Titanium Dioxide Catalysts

Heterogeneous (solid) catalysts, and in particular supported oxide catalysts, have a wide range of applications in chemical and fuel manufacturing. Unlike many homogeneous (soluble) catalysts, enzymes, or zeolite catalysts, supported oxides typically do not discriminate between two reactants with the same chemical groups, but of different molecular sizes. Thus, the synthesis of oxide catalysts that are size- or shape-selective would open up new possibilities for more efficient catalysis. This presentation describes the synthesis and catalytic testing of materials consisting of partial Al₂O₃ coatings on TiO₂, leading to shape-selective reaction of the residual exposed TiO₂ catalytic surface. The size-selectivity of these materials is illustrated by kinetic studies of competitive photocatalytic oxidation of benzyl alcohol (BzOH), 2,4,6-trimethtyl benzyl alcohol (TMBzOH), and 2-adamantanol (AdOH). The ratio of the rate constants for competitive photooxidation of BzOH and TMBzOH [rate(BzOH)/rate(TMBzOH)] was 1.7 for bare TiO₂, while the same ratio was 7.7 for TiO₂ partially covered by 5 layers (0.5 nm) of Al₂O₃. An equivalent experiment with BzOH and AdOH showed that the ratio of rate constants [rate(BzOH)/rate(AdOH)] for bare TiO₂ was of 1.5, and 5.7 for the catalyst partially coated with 5 layers (0.5 nm) of Al₂O₃. This and other data to be presented confirm that these modified catalysts are capable of sharp selectivity towards less-bulky reactants, by impeding the bulkier reactants from adsorbing onto the active catalytic surface (the TiO_2). These are novel catalytic materials in general and may lead to applications in the selective "green" oxidation of alcohols by atmospheric oxygen.

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Jungwha (Paula) Ham

Faculty: Amy Rosenzweig

Preliminary Characterization of Particulate Butane Monooxygenase (pBMO) from Nocardioides sp. Strain CF8

Butane monooxygenase (BMO) is an enzyme capable of oxidizing butane to butanol. It is found in the gram-positive species, *Nocardioides* sp. strain CF8, which utilizes butane as an energy source. The BMO active site is believed to be a dinuclear copper center located within the subunit known as bmoB. To further understand the function and structure of this enzyme, a number of protein constructs of the bmoB subunit have been cloned and expressed. Preliminary characterization of truncated bmoB constructs will be presented.

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Britta Hanson

Faculty: Deborah Cohen

A Question of Tolerance: Sodomy in the Victorian Royal Navy

John Peach was drunk. At least, that was the excuse he and Edward McGee gave when they were found in bed together on the HMS Isis in 1837. Until 1860, the mandatory punishment for sodomy (a catch-all term for sexual contact between men) in the British Navy was death. But neither Peach, nor McGee, nor any sailor charged with a sodomy-related crime was sentenced to death after 1828. Was this a legal fluke, or a sign of potential tolerance? To find out, I traveled to London on a Summer Undergraduate Research Grant to work with the court martial records at the National Archives. Afterwards, I expanded my research into an Independent Study project, and have reached an intriguing conclusion. The average Victorian sailor became relatively indifferent to these commonplace trysts, making the cases unlikely to be reported. In addition, the governing body of the Navy, the Admiralty, hated the bad publicity that came with sodomy trials. So while the Navy officially condemned sodomy, and convicted whomever they could, they preferred sidestepping the issue altogether, including refusing to use terms such as "sodomy" or even "sex" during trials. Sailors who directly addressed the details of their case were therefore more likely to be acquitted by their squirrely judges. Peach and McGee, though caught in a very compromising position, were simply whipped and discharged. This theory suggests that even at this early date, the subject of sex between men generated public outrage coupled with private acceptance.

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Christine Hazday

Faculty: Shalini Shankar

The Cuatro Is My Flag/ El Cuatro es mi Bandera

In this ethnographic study, I explore identity formation and socialization through heritage cultural classes among Puerto Rican youth. I analyze the Cuatro Festival, a music intervention program affiliated with the Puerto Rican Arts Alliance, in Humboldt Park. The *cuatro*, a four-stringed guitar, an instrument exclusive to Puerto Rico, fosters pride and community among the Puerto Rican participants. I am most interested in the following two inter-related processes: how participants are socialized to understand and participate in their ethnic heritage culture, develop a Puerto Rican identity and develop a positive orientation toward schooling in Chicago. The Cuatro Festival serves as a case study to bridge academic values and cultural practices. The Cuatro Festival is a lens to understand the ways in which a cultural enrichment program can help youth form a cultural and ethnic identity despite the established "White" curriculum of the public school system. I will draw upon academic literature, personal interviews, recordings of the Cuatro Classes and conversations with participants and their parents to examine the narratives that emerged in my fieldwork interviews and observations.

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Jeffrey R. Heiferman

Faculty: David Bentrem

Inhibition of 5-Lipoxygenase Reduces Polyposis in APCDelta468 Mice

Colorectal cancer is the second leading cause of cancer-related mortality in the United States. Inflammation is known to play a key role in the pathogenesis of colon cancer. Patients with inflammatory bowel disease have an increased risk of developing colorectal cancer. Our lab has demonstrated that 5-lipoxygenase (5-LO), an enzyme in the arachidonic acid pathway, is involved in the development of adenomatous polyps, which are known precursor lesions to colorectal cancer. Previous studies have involved genetic knock-out of 5-LO in mice that were predisposed to develop adenomatous polyps. These mice were found to have a reduction in polyposis. In the current study, we pharmacologically inhibited 5-LO using zileuton, a 5-LO specific inhibitor presently used to treat asthma. The mice were fed a chow containing 1200 parts per million of zileuton, while control mice were fed the same chow without the drug. We found the zileuton fed mice had a 60% decrease in polyp number compared to mice on the control diet. Furthermore, the zileuton fed mice weighed 9% more and were more energetic, both indicators of improved health. This study demonstrates that pharmacological inhibition of 5-LO in our polyposis model is feasible and results in a dramatic reduction of polyp burden. These results are significant because zileuton is already an FDA approved medication. Our study provides pre-clinical evidence for the expansion of zileuton as a possible anti-cancer therapy, however, further studies are needed. This study was co-authored with Michael J. Heiferman, Joseph D. Phillips, Eric C. Cheon, Nicole R. Blatner, Khashavarsha Khazaie, Paul J. Grippo, and David J. Bentrem.

Nicole Hendrix

Faculty: Susan Hespos

Language's Influence on Early Cognition

Infants rapidly acquire their native language. Recent studies have demonstrated not only that words influence infant object categorization at three and four months but also that the facilitative effect is not initially limited to human language. Specifically, monkey calls also promote object categorization at 3- and 4-months, but only human speech facilitates the effect at 6- and 12-months. In the current research, we consider this tuning effect more closely, examining English-acquiring infants' reaction to labeling phrases in Mandarin. In the first study, we adopted the same design as in previous work, but we introduced 3-, 4-, and 12-month-old infants to phrases spoken in Mandarin. Infants were familiarized with eight category exemplars, each accompanied by a Mandarin labeling phrase. At test, infants were presented with two new images: a new member of the now-familiar category and a member of a novel category. The results converged with the evidence from monkey calls: Mandarin phrases (like monkey calls and native language labeling phrases) facilitated object categorization at 3and 4-months but not at later ages. In the second study, we considered the effect of brief Mandarin exposure on 8- and 12-month-old infants' object categorization. Infants and parents first participated in a 'mini-immersion' experience with a native Mandarin-speaking experimenter before participating in the design used in Experiment 1. This Mandarin exposure affected the performance of 8-month-olds (who now formed object categories in the task) but not 12-month-olds (who continued to perform at chance levels).

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Emily Hittner

Faculty: Nina Kraus

Musical Experience and Binaural Processing in the Auditory Brainstem

The auditory system is a complex neural network that demonstrates remarkable flexibility in how it represents the sounds of a dynamic world. For instance, the auditory system's sensitivity to timing is one mechanism that allows it to encode a seemingly endless variety of sounds. Binaural processing, involving the integration of incoming sounds from both ears, helps locate where a sound is coming from and distinguish a target sound from competing sound streams. Binaural processing skills can be clinically evaluated through assessments such of speech perception in the presence of background noise. Physiological measures, (i.e. measuring auditory brainstem responses) can provide insight into this intricate network of binaural processing. While previous research has shown that musicians have better speech-in-noise performance in binaural physiological measures compared to nonmusicians, it has yet been determined if this is purely a binaural advantage or if it can be seen in a monaural (input from only one ear) condition as well. Here, we investigated whether superior binaural and/or monaural processing in the auditory brainstem is associated with musical expertise in young adults between the ages of 18-25 years. Results show that musicians have enhanced responses compared to nonmusicians only in a binaural, not monaural, condition. Physiological indexes of binaural processing relate to measures of speech-in-noise perception suggesting that the musician speech in noise advantage is driven, at least in part, by better binaural processing.

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Aaron Holsteen

Faculty: Lincoln Lauhon

Intrinsic and Extrinsic Mechanical Dissipation within Vanadium Oxide Nanomechanical Resonators around the MIT Transition

Within the past decade, optical interferometry has been used as a cost-effective and viable method for nano-scale displacement detection of high-frequency resonators. My research this past year has focused on the construction of a polarization dependent fiber-coupled interferometer capable of measuring the high-frequency displacement of resonating nanostructures. By making use of optical interference due to the path-length difference between a reference reflection and a focused sample reflection mapped over a scanned area, both interference imaging and single-point frequency analysis is achieved. By examining the frequency response of the nanostructures, the quality factor can be directly determined. The quality factor is a measure of the energy loss (or damping) within a vibrating oscillator which is tied to the intrinsic and extrinsic characteristics that limit a resonator's sensitivity to an externally applied force. My project examines changes in the intrinsic damping within vanadium dioxide nanowires as they pass through the metal to insulator transition (MIT). It has been proposed that enhanced mechanical dissipation at the transition is due to oxygen vacancy migration at the moving domain wall. Experimentally, the MIT phase transition has been observed via a heating and cooling hysteresis in reflectivity and resonant frequency. Based on a sharp decrease in the quality factor of muli-domain nanowires, intrinsic mechanical dissipation most likely due to domain wall motion has been observed. In addition to intrinsic damping, extrinsic effects such as ambient gas pressure and molecular adsorption are distinguished from the nano-scale resonator's intrinsic response.

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Sarah Hong

Faculty: Victor Shih

The Changing Composition of Political Elites during Periods of Leadership Transition in East Asian Authoritarian Regimes

With the recent death of Kim Jong II, there exists ample literature speculating the consequences of Kim Jong Un's ascension to power. However, due to the absence of institutionalized succession mechanisms in authoritarian regimes, one cannot even guarantee that Kim Jong Un will be able to maintain power, much less make speculations on the trajectory that the regime may take under his leadership. In light of the inability to guarantee a successor's ability to retain power, my research focuses on how political elite membership can be used as an indicator of the pending success, or failure, of leadership transitions. I focus specifically on the changes in Politburo membership during the transitions between Mao Zedong-Hua Guofeng in China and Kim II Sung-Kim Jong II in North Korea. My research finds that successful leadership transitions exhibit low volatility of changes in political elite membership, while increasing volatility marks unsuccessful transitions that ultimately culminate in the ousting of the pre-appointed successor. These results confirm that power struggles

between varying factions manifest themselves in Politburo membership and have an adverse impact on the success of leadership transitions. Consequently, an analysis of the trends in political elite membership in post-Kim Jong II North Korea will provide a clearer picture regarding the long-term sustainability of Kim Jong Un's succession.

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Kian Hudson

Faculty: Laurel Harbridge

The Donut Congress: The Top-Two Primary and the Missing Center in the California State Legislature

This thesis seeks to determine whether California's recent switch to a new electoral system - designated as the "top-two" primary - is likely to mitigate the polarization of the state's legislature, which is the most polarized among American states. First, possible causes for *why* the California state legislature has become more polarized are examined. Then, this thesis explores how these possible causes may be affected by the top-two primary. The explanations for California's legislative polarization are evaluated using longitudinal data from California and comparative data from the three states currently using the top-two primary: California, Washington, and Louisiana. This thesis concludes that the most compelling explanations for California's legislative polarization are that California voters have become more and more ideologically and geographically sorted; this thesis also suggests that the scenarios in which the top-two primary could be expected to reduce California's legislative polarization are quite limited. There is scattered empirical evidence that some of these scenarios exist in California, but in general the prospects for the top-two primary to mitigate California's legislative polarization are not great.

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Samuel Ide

Faculty: John Bushnell

Kyrgyzstan and China: Kyrgyz Elites' Opinions of a Giant Neighbor

Kyrgyzstan, a poor Central Asian country of 5.5 million people, shares an 858 km border with China, the world's most populous country. This study sought to determine how Kyrgyz elites perceive the political relationship between Kyrgyzstan and China, and China's growing influence in Kyrgyzstan. Research was conducted in Bishkek, Kyrgyzstan through interviews with a wide variety of political officials, NGO workers, and academics to answer this question. The study determined that Kyrgyz elites politically focus almost entirely on Russia, due to a cultural and historical legacy dating back to Kyrgyzstan's inclusion in the Soviet Union. This is despite the fact that China has increased economic trade and development with Kyrgyzstan. The conclusion reached was that China primarily deploys soft power methods when dealing with Kyrgyzstan, and does not require, nor seek a political relationship with Kyrgyzstan. Thus, Kyrgyz are left to pursue a political relationship primarily with Russia, as long as China's economic interests in the country are secure.

Other factors that affect Kyrgyz elites' perceptions of China that the research uncovered are Kyrgyz nationalism, and views on the West.

ନ୍ଧର୍ୟ

JC Jacobs

Faculty: Richard B. Silverman

Prodrug of Fluorinated Mevalonates to Inhibit the Mevalonate Pathway in Streptococcus pneumonia

Streptococcus pneumoniae is a common pathogenic bacterium and the primary cause of many infections such as pneumonia, meningitis, and many others. This deadly pathogen kills over one million people per year, mostly in developing countries. In the United States, vaccination programs have been used to control this pathogen. Over time, the pathogen has mutated, however, and strains have been found that are resistant to the streptococcus vaccines. Even vancomycin, the antibiotic that is used as a "last resort" to treat these infections, has been showing weaknesses against these new strains of S. pneumoniae. Therefore, a new approach needs to be found to combat this deadly organism. The pathogen requires isopentenyl diphosphate (IPP) to survive in human lung or serum. IPP is produced via the mevalonate pathway in three ATP-dependent steps, catalyzed by GHMP family kinases, and is an important building block for isoprenoids. Fluorinated analogs of diphosphomevalonate (DPM) bind to an allosteric site on mevalonate kinase to inhibit the first step in the pathway, while simultaneously mechanistically inactivating the final decarboxylation step of the pathway. This double inhibition is selective for the mevalonate pathway in S. pneumoniae and makes the target compound a potential potent antibiotic against this deadly pathogen. Due to its charged nature, however, diphosphomevalonate is unable to penetrate the cell wall of the bacterium. The purpose of this study, therefore, is to synthesize a series of prodrugs of fluorinated DPM that could potentially penetrate the cell wall, become the desired compound within the cell, and inhibit the mevalonate pathway.

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Amanda Johnson and Alexandra Zayed

Faculty: Jannet Chang

Ditching the Dome: The Minnesota Vikings' Pursuit of a New Stadium

For over ten years the Minnesota Vikings football team has worked to rally support within the state of Minnesota for the construction of a new football stadium. Their mission to obtain a new space to play became even more urgent in December 2010 when a snowstorm collapsed the roof of the Metrodome, the team's current home. Unfortunately for the Vikings, the task of building a new football stadium comes with a \$1 billion price tag. One early plan to finance the new facility involved the state and local governments of Minnesota covering approximately \$600 billion of the cost and the team picking up around \$400 billion of the total bill. By examining the specific proposals to raise this money—specifically sales tax increases, gambling taxes, and user charges—it is clear that the team's contribution toward financing a new stadium should be increased. As the primary recipients

of the benefits of a new playing space, the Vikings should be responsible for absorbing the majority of the cost, not the state and local governments.

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Sara Kashani

Faculty: Anju Peters

Clinical Characteristics of Patients with Chronic Rhinosinusitis and Specific Antibody Deficiency

Specific antibody deficiency (SAD) involves an inadequate polysaccharide vaccine response, often evaluated in patients with continual infections such as chronic rhinosinusitis (CRS). There is limited data on patients with CRS and SAD. We assessed the clinical characteristics, comorbidities and outcomes of these patients. A subgroup of patients with chronic rhinosinusitis (CRS) also has a specific antibody deficiency (SAD), characterized by normal IgG levels but inadequate polysaccharide vaccine response. There is limited data on patients with CRS and SAD. We assessed the clinical characteristics, comorbidities and outcomes of patients with CRS and SAD. We reviewed the electronic database records of patients with CRS who were evaluated for immunodeficiency with quantitative immunoglobulins or pneumococcal antibody titers checked pre- and post-Pneumovax® between 2002 and 2011. The subjects' clinical and laboratory results were assessed. Of 528 subjects with CRS, 149 (28%) had CRS with nasal polyps (CRSwNP) and 379 (72%) had CRS without nasal polyps (CRSsNP). Of the 247 subjects evaluated for SAD, 50 (20%) had an inadequate response to the vaccine (10 of 68 [15%] in the CRSsNP group and 40 of 179 [22%] in the CRSwNP group). Nonresponders had significantly lower IgG levels, although within normal range (>700 mg/dL), compared with responder and normal baseline subjects (874.0±308.2 vs. 956.7±212.4 vs. 1022.5±281.0, p<0.01). Nonresponders received more antibiotics courses relative to responders in the two years following Pneumovax® (3.12±2.52 vs. 2.30±2.42, p<0.05). CRSsNP asthmatics had significantly lower post-immunization titers compared to CRSsNP non-asthmatics (9.17±3.28 vs. 7.49±3.585, p<0.05). Eleven nonresponders (22%) received immunoglobulin (Ig) replacement therapy. Of 247 CRS patients evaluated for immunodeficiency, 20% had SAD. On average, those with SAD received more courses of antibiotics than those without. Eleven patients with SAD (22%) received Ig therapy over an eight-year time period, suggesting that a majority of these patients do not need Ig therapy.

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Elisse Kavensky

Faculty: Christopher Kuzawa

The Effects of Malnutrition Timing and Catch-Up Growth Velocities on Cognitive Development in Filipino Boys and Girls: A Non-Interventional Longitudinal Study in Cebu, Philippines

Research has shown that being chronically malnourished and severely growth stunted is one of the most prevalent predictors of retarded cognitive development. Using data from the Cebu

Longitudinal Health and Nutrition Survey (CLHNS), this study examines the developmental periods when growth stunting poses the most adverse effects to cognitive development, if and when these effects can be overcome by moderate to fast growth velocities or catch-up growth, and whether growth stunting and catch-up growth affect boys and girls similarly. Anthropometric data was collected from 1,945 Filipino children at birth, age 2, and age 8.5, surveys were conducted to assess culturally confounding variables and a standardized IQ test was administered at to the participants at age 8.5 to quantify their cognition levels. Three different periods when stunting occurs in children were considered: before birth, from birth to age 2, and ages 2-8.5. Growth was considered severely stunted (HAZ \leq -3), moderately stunted (\leq -2), or not stunted (HAZ>-2) in accordance with World Health Organization (WHO) guidelines. Catch-up growth was considered to have occurred if a child was stunted at birth but no longer stunted at age 2 or age 8.5, or if a child was stunted at age 2 but no longer stunted at age 8.5. Growth velocities were calculated during three periods -- gestation, early development (birth-age 2) and later development (ages 2-8.5). The velocities were tertiled and labeled as slow, moderate, or fast. Analysis was divided among boys and girls to assess the effects of gender on these growth trajectories. The results suggest that boys who exhibit moderate to high growth velocities during early development and girls who exhibit moderate to high growth velocities in later development are likely to have higher IQ scores than children with slow velocities during these periods. These findings could have significant implications on future public health policy.

ନ୍ଧର୍ୟ

Sasha Bayan Khadivian

Faculty: Anne Waller

Sonic Bonding: National Identity and the Music of the Oppressed in Brazilian Popular Music

"When you think of Brazil, two things come to mind: soccer and samba."--Douglas Malharo, music director of Lapa 40 Graus in Rio de Janeiro. The music of samba is an iconic symbol of Brazil's national identity, particularly for the city of Rio de Janeiro. Its popularity is no accident, however. With frequent airplay, presence in nightclubs, annual competitions, and a central role in the Brazilian Carnival, samba boasts a listenership that few musical genres rival. I spent the summer of 2011 in Rio de Janeiro studying the music of samba and interviewing musicians, dancers, club owners, and samba aficionados in an effort to understand why the music of jazz, a uniquely American art form, does not enjoy the same degree of popularity that samba does. Reflecting on Douglas's quote, I sought to understand why jazz does not come to mind when one thinks of the United States in the same way that samba comes to mind when one thinks of Brazil. My project explores the distinct qualities that have allowed samba to become and remain more popular than many of its stylistic counterparts. The project both articulates these characteristics and contrasts them with the genres of classical, jazz, and flamenco music. My research concludes with an exploration of the popularization of the music of the oppressed and its transition from ghettos to radio waves.

ഗ്രര

Matthew Kluk

Faculty: Stephen Eisenman

The Maison Cubiste: Modernist Fantasy and Bourgeois Reality

The Maison Cubiste-André Mare's decorative arts ensemble exhibited at the 1912 Salon d'Automne art exhibition—has held many places in the history of art since its initial display. The temporary structure consisted of a plaster façade, entry hall, small bedroom, and salon living room. Spread throughout were decorative arts objects and several (Cubist) paintings. Historians have argued that the installation deployed, if not imposed, a Cubist rationality on everything from the exterior architectural ornament to the house slippers displayed within. However, with its unique mix of traditional and modern design elements, the Maison Cubiste has often been viewed as both an oddity and pastiche in the canon of Cubism. However, returning to the original documents and narratives surrounding the structure in 1912 reveals that neither the original artists, nor their critics, viewed the ensemble through the lens of Cubism. Rather, the stagnant French decorative arts, industrial competition with Germany, and the quest for an inherently French modern style were their chief concerns. In 1912, there was no such thing as the Maison Cubiste, just André Mare's ensemble. The structure became lost in the nascent histories of Cubism but reappeared in the aggrandizing narratives of modernist art history which bequeathed upon the ensemble its now-famous name. This thesis traces the historiography of the Maison Cubiste to illuminate what it was and what, in the intervening years, it became. After stripping Mare's ensemble of its dubious history and name, I focus on what it actually is. I argue that Mare's ensemble, having little to do with Cubism, navigated industrial modernity and proffered an answer to the question of how one might and should live in the modern world. It struck a balance between tradition and modernity that paved the way for modernist design that would come to prominence in the International Style and the display of Le Corbusier's Pavillon de L'Esprit Nouveau in 1925.

ନ୍ଧର

Sheila Kredit

Faculty: Christopher Kuzawa

Breastfeeding Cessation among WIC-Enrolled Immigrant, Hispanic, and African American Women in Chicago

As more and more research demonstrates the health benefits of breastfeeding and the health risks of formula, promoting and supporting breastfeeding has become a key objective of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Currently, women in WIC initiate breastfeeding at a lower rate than the national average and cease to breastfeed before the one year mark recommended by the American Academy of Pediatrics. The goal of this study was to determine what experiences, attitudes, and perceptions influence the infant feeding choices of mothers in different Chicago neighborhoods and how the WIC program could best encourage breastfeeding within the different Chicago clinics. To answer these questions, the Breastfeeding Ceased Reports for the Uptown, South Lawndale, and Englewood WIC clinics were analyzed at the Chicago Department of Public Health. Then, ethnographic interviews were conducted with thirty women at these clinics. The results of my research showed that mothers in Chicago develop an

intention to breastfeed through a variety of means: higher education, greater knowledge about breastfeeding, influential people, influential cultural traditions, experiences with healthcare institutions and WIC, and feelings of confidence and commitment. Furthermore, I found that the longer a woman intended to breastfeed, the longer she did in fact breastfeed. However, I also found that women in Chicago encounter many barriers to breastfeeding including physical problems, work and school constraints, lacking time and energy, and social pressures. The most effective way of helping mothers overcome these barriers seemed to be increased education about and help with breastfeeding.

ନ୍ଧର୍ୟ

Kyle Kremer

Faculty: Vicky Kalogera

Spin Tilts in the Double Pulsar Reveal Supernova Spin Angular-Momentum Production

Binary star systems containing two neutron stars are of great interest to researchers in astrophysics. When one or both of the neutron stars in the system are observed as pulsars, the system becomes even more valuable for research. Presently, seven observed double neutron star systems are known to contain one pulsar. In 2003, the first binary system (J0737-3039) containing two pulsars was discovered, the only such system known to date. The presence of two pulsars in this binary system provides the unique opportunity to measure the spin orientation of both stars. Here we demonstrate that the significant difference between the two pulsar spin tilts observed in the J0737-3039 system requires that the supernova explosion that formed pulsar B must have produced a substantial off-center kick imparted to the nascent pulsar, causing pulsar B to tumble to its current misaligned state. This constraint marks the first direct observational evidence of angular momentum generation in supernova explosions.

ନ୍ଧର୍ୟ

Amy Krischer

Faculty: Amy Booth

Exploring Children's Use of Referential Intent to Learn New Words across Socio-Economic Strata

It is well known that language performance differs between children from disparate socio-economic strata. This difference has been mostly described in terms of the number of words children know as they enter school. However, little else is known about the nature of this 'vocabulary gap.' In particular, we do not know whether children vary across SES in the wide variety of skills that children require for successful word learning. This study examined one of these skills: the ability to use pragmatic cues (e.g., gesturing) to determine the referential intent of a speaker. Specifically, we tested whether children from differing SES backgrounds (measured by level of maternal education) could use the direction of a speaker's eye gaze to correctly map new words onto their referents. Although performance on this task was not found to vary with SES (r= .13, p=.6), it did vary with receptive vocabulary levels as measured by the Peabody Picture Vocabulary test (r= .457, p= .049),

suggesting that this is a meaningful measure of word learning skills. These results suggest that, although gesture use by parents appears to vary across SES, direct sensitivity to gesture does not appear to contribute to the vocabulary gap. Nevertheless, it will be important to continue to evaluate other aspects of word learning and so we can determine where to best pinpoint intervention efforts.

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Pavan Krishnamurthy

Faculty: Yael Wolinsky and Jason Seawright

Civic Participation and the Environment: An Exploration of Volunteering Motives of College-Aged Students

The last four decades have seen a particular increase in environmental protection. While these practices come from governmental, corporate, and international organizations, there is a strong need for grassroots mobilization and often students are seen as the missing link. However, there is currently a lack of extensive research concerning environmental service among undergraduate students. It is understood that non-traditional education is a powerful means to enlighten future leaders. Considering the growing significance of environmental protection, it has become important to analyze and develop better understandings of the motives of volunteers to guarantee stronger retention rates. This study attempts to examine three aspects of Voluntary Environmental Service (VES) and Voluntary Service (VS), in regards to undergraduate Northwestern University students in VES and VS? (2) What motivates these students to participate in either VES or VS? (3) Which of these motives tend to keep students actively engaged? The study is co-authored with Emma Solanki.

ନ୍ଧର

Jonathan Lamano

Faculty: CJ Heckman

Neuronal Morphology of Amyotrophic Lateral Sclerosis: Characterization of Disease Progression at the Neuronal Level

Characterization of the neuronal morphology of Amyotrophic Lateral Sclerosis (ALS) from young age into adulthood is necessary to the understanding of the mechanism of the late-onset disease. Two photon microscopy and neuronal reconstruction facilitated by Neurolucida allowed for the morphological reconstruction and analysis of spinal cord motor neurons of non-transgenic wild type (WT), transgenic human superoxide dismutase 1 wild type (WT*), and transgenic superoxide dismutase 1, SOD1G93A high expresser line, (SOD1) mice at crucial time intervals in disease progression. Through MATLAB, a program was designed to automate the neuronal reconstruction process and increase efficiency. Morphological parameters of interest included largest soma crosssectional area, soma surface area, soma volume, stem dendrites, nodes, dendritic length, dendritic surface area, and dendritic volume. Preliminary combined (male and female) results at two time intervals (Postnatal days 25-35 and 45-55) indicate that at young age, SOD1 neurons exhibit

excessive soma growth and dendritic branching. However, by the P45-55 interval there are no significant differences in soma size, although excessive dendritic growth persists. This may indicate a possible mechanism for ALS, in which neuronal growth is expedited until a maximum sustainable size is reached, at which point neuron failure occurs. Moreover, the results indicate gender differences in the morphological manifestation of the disease which may serve to explain the different symptoms expressed in patients of different genders. Comparison of SOD1 with WT* data (serving as a stronger control) indicates a difference only in stem dendrite proliferation, although sample sizes are currently too small to draw significant conclusions.

ନ୍ଧର୍ୟ

Christine Lee

Faculty: Karl Rosengren

Comparison of Acculturation and Parenting Style in Caucasian-American and Chinese-American Families

Previous studies have shown how Chinese and Western cultures differ on many variables, such as parenting style. However, the ways in which this cross-cultural research pertained to a bicultural population, a population which increasingly describes the make-up of the U.S., were less studied. This study compared Chinese-American families to Caucasian-American families on measures of acculturation and parenting style. Data were collected through online surveys, Chinese churches and schools, and in-person visits to the lab. Analyses of the results showed that the General Ethnicity Questionnaire, which measured acculturation, reinforced previous results of a statistically significant inverse relationship between a Chinese and an American identity. Thus, the more Chinese traits that were endorsed, the less American traits were endorsed. Acculturation was also mediated by generational status for Chinese Americans. Therefore, the more recent immigrants to the U.S. associated with Chinese culture more. Generation status was not significant for Caucasian Americans. Surprisingly, an authoritarian parenting style was associated with American culture for Chinese-American participants. Yet firstborn Chinese American children were the ones associated with an authoritarian parenting style, while the second oldest children were associated with both an authoritarian and authoritative parenting style. This study suggests that generation status could be used to determine how strongly the results of cross-cultural studies apply to bicultural populations such as Chinese Americans.

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Alcina Lidder

Faculty: Richard Zinbarg

Watch What You Say: Spoken Self-Statements, Emotion, and Behavior

The current study explores the effects of positive and negative self-statements ("I can" and "I can't") on emotion and behavior. White-Schwoch (2011) studied these effects in participants with different levels of blood-injection-injury (BII) fear. Participants read "I can" or "I can't" statements and then performed a behavioral approach task in which they viewed BII, positive, and neutral

images and their looking times and self-report affect ratings were recorded. In the "can't" condition, the greater an individual's BII fear, the less time he or she looked at the BII pictures. However, in the "can" condition, there were no significant differences in looking time based on BII fear level. Looking time differences were not limited to only BII pictures, though. To explore these surprising results, we modified the behavioral approach task such that stimuli were grouped together in blocks based on valence. Participants were randomly assigned to read "I can" or "I can't" statements and completed the new behavioral approach task. Looking time and affect rating results will be analyzed by repeated measures hierarchical linear regressions. We expect a negative correlation between BII fear and (only) BII stimuli looking time in the "can't" condition will rate the BII pictures more negatively than those in the "can" condition. The study's findings can inform clinical intervention with psychotherapy patients who use hyperbolic negative language when discussing their feared stimuli or event. The presenter would like to thank Dr. Richard Zinbarg and Travis White-Schwoch for their help and guidance throughout the project.

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Madison Loew

Faculty: Rodda Leage

The Use of Nostalgia in Period Dramas and Its Effects on Program Popularity

This paper explores the power of nostalgia when incorporated into entertainment, and how consumers engage in nostalgic consumption. Though the sources vary in their definitions of nostalgia, all can agree that something must trigger the feeling of nostalgia, and that it causes the person to wish to forsake the definite present in favor of the indefinite past. Dissatisfaction with the present can be caused by external stimuli, discontinuous events that trigger people to seek refuge in what is familiar (their past) or by a feeling of disassociation with the present, and identifying with another time. In understanding the reasons behind nostalgic consumption, I can examine the effectiveness of period dramas as forms of nostalgic entertainment and evaluate *American Dreams*, *Mad Men*, and *Pan Am* in their efforts to capitalize on Americans' preference for nostalgic entertainment.

ନ୍ଧର୍ୟ

Andrea Marcos

Faculty: James Rosenbaum

Higher Education Alternatives for Disadvantaged Students

The research question that led this joint MMSS and Sociology thesis was the following: What is the most rewarding educational degree for the economically and academically disadvantaged population of students to pursue after graduating from high school? Using two different statistical methods that accounted for selection bias, multivariate regression analysis and propensity score matching, the economic return of a bachelor's degree, an associate's degree, and a certificate were estimated for the sub-population of interest. The results indicate that the returns to a bachelor's degree might not be

worth the effort for the typical disadvantaged student to attain without considering the possibility to obtain a scholarship. The return of an associate's degree is also not that clear without taking the student's intended field of study into account. After accounting for the average real and opportunity costs involved, this thesis concludes that a lack of post-secondary degree alternatives exist for the average disadvantaged student to pursue after high school.

ନ୍ଧର୍ୟ

Laura Markey

Faculty: Mark Mandel

The Leucine-Responsive Regulatory Protein (Lrp) Influences Multiple Symbiotic Phenotypes in Vibrio fischeri SR5

The Hawaiian bobtail squid Euprymna scolopes is born sterile, but its light organ is colonized by a single species of bacteria, Vibrio fischeri, within hours of hatching. This symbiotic relationship is essential to the survival of the squid, as the bacterial bioluminescence prevents the squid from casting a shadow while hunting in the moonlit sea, hiding it from predators swimming below. V. fischeri also benefit from the symbiotic relationship, as the squid host provides the bacterial population with nutrients and a competitor-free environment. Although V. fischeri make up less than 0.1% of the bacterial community in the Hawaiian seawater, selective mechanisms exist such that only certain strains of V. fischeri colonize the developing light organ. The V. fischeri/E. scolopes symbiosis is used as a model system to study the mechanisms underlying establishment of symbiosis, as such selective mechanisms are also important in the establishment of human-bacterial symbioses. My research focuses on V. fischeri SR5, a strain that was isolated from the Mediterranean bobtail squid, and is also able to colonize E. scolopes in the laboratory. My work examines the genetic basis of luminescence regulation in V. fischeri SR5 and constitutes the first molecular examination of this strain. I performed a transposon mutagenesis screen for luminescence phenotypes, and isolated 26 strains (out of 9,000 screened) with insertions that significantly altered luminescence. Of these, only strains with an insertion into the gene *hp*-encoding the Leucine Responsive Regulatory Protein-also displayed a squid colonization defect. My current research aims to understand the molecular basis for the role of Lrp during the process of squid colonization. I am investigating hypotheses that the colonization defect results from Lrp regulation of bacterial motility and/or its regulation of diffusible signal molecules (autoinducers) utilized in the control of luminescence and colonization pathways.

ନ୍ଧର୍ୟ

Megan McGee

Faculty: Cynthia Rivera

The Significance of the Nashville Parthenon on the Cultural Landscape of Nashville

My senior thesis will focus on the cultural importance of Nashville's Parthenon by examining the role it played as Nashville's identity fluctuated from the time it was constructed in 1897 to the time it was permanently rebuilt during the 1920s. There is extensive literature written on the history of

Nashville and its classical influences, however there is little that explores the cultural significance of such an iconic monument in the country music capital of the country. Using the existing literature, as well as newspapers and my own independent research, I will explore the reasons why the Parthenon was constructed and painstakingly reconstructed. I hypothesize that the Parthenon's construction was in part due to a long-standing, if tenuous claim, that Nashville was known as the "Athens of the South" and this monument was created in order to cement this idea. However, with the promotion of country music, Nashville's identity began to change. Nashville became known as "Music City, U.S.A" along with the rise of country music, a distinctly blue collar movement, while its older, more elite identity as the "Athens of the South" became less relevant. In order for Nashville's elites to maintain their identity, the monument was permanently rebuilt in the 1920s. Today, the Parthenon remains a popular tourist attraction and a symbol of elite influence on Nashville's landscape.

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Frances McGill

Faculty: Katherine Hoffman

The "Death of the Street?" Social Networks and Reimagined Space in Sidi Moumen

As a concept, the "street" can take on many meanings: among others, the physical avenues through which people move, the space in which social and commercial exchanges occur, or the contested public ground upon which different classes and social groups meet to negotiate for control of space and identity. Recent neoliberal trends in urban development have raised the question of whether the street, in its literal, figurative, or imaginative form, is disappearing in cities today. This thesis explores this question through a ground-level study of people's daily lives and social worlds in Sidi Moumen, a southwest district of Casablanca that has been undergoing rapid development through the Villes Sans Bidonvilles (VSB) or Cities Without Slums UN Habitat program. Some contend that VSB, which is replacing informal settlements with apartment buildings, is causing people to shift to more private, contained lifestyles, akin to those of families in the West. However, the reality on the ground is much more complex. Through an examination of people's social networks, public discourse, and use of space, I will demonstrate that while the "street" is indisputably changing in its observable form, figuratively it is still alive in the daily social exchanges and movement of Sidi Moumen's residents, whose lives are anything but contained or private. This study offers an important ground-level picture of people's daily lives within the context of large-scale urban development, rural-urban migration, and resettlement. Programs like VSB are being carried out in neighborhoods throughout North Africa and the world. This case study thus contributes to our understanding of how people are interacting with and within these evolving spaces and has implications for future project design and urban planning.

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Redmond McGrath

Faculty: Henri Lauziere

A New Social Club: 1500 North Lake Shore Drive and the Chicago Wealthy's Move to Cooperative Apartments

In the 1920s, Chicago saw a rapid and significant growth in multi-family structures. During this period, a substantial number of the wealthy moved from single-family homes to cooperative apartments on Chicago's Gold Coast. To explain this phenomenon, historians argue that the shortage of servants after World War I and the rising cost of living in single-family homes, among other economic factors, had become too great for lifestyle upkeep. Using this explanation misrepresents the true financial power of the wealthy in Chicago at this time. Given wealthy Chicago's dedication to giving off an air of prosperity, it is evident that other reasons must have driven these Chicagoans to move in with their social peers under the same roof, a concept still not entirely accepted by the urban American upper class. With the intention of filling the void left between reasoning and reality, this thesis argues that although economic concerns existed, Chicago's wealthy made the move to luxury co-operative buildings instead to maintain exclusive communities that defined the boundaries of their social set and allowed them to work more efficiently as members of that group. 1500 North Lake Shore Drive, constructed between 1927 and 1929 by McNally & Quinn with the help of the famous Rosario Candela of New York, serves as the backdrop for this project, as it was the most luxurious and expensive of the cooperative apartment buildings built during this period. Using primary source material from the building's architectural firm, this thesis challenges traditional notions of the migration from single-family homes to luxury cooperative apartments in Chicago's upper class during the 1920s.

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Charlotte Melbinger

Faculty: Francesca Tataranni

Barbarian Queens as the Oriental Other in the Augustan Regime

This project examines the development of the field of ethnography in ancient Greek and Roman accounts. The thesis project focuses on ethnography, the observation and written description of other peoples and civilizations, matured over time, beginning with brief mentions in Homeric poetry and concluding with the politicized writings of Augustan-era Rome. Research of ethnographic documents from ancient Greece and Rome led to the pinpointing of certain conventional descriptions or stereotypes of peoples that were non-Greek and eventually non-Roman. The project focuses on those stereotypes that pertain to Oriental cultures, such as Egyptian and Phoenician. The second half of the project analyzes the written descriptions of two barbarian queens, Cleopatra of Egypt and Dido of Carthage, in their appearances in Augustan literature. These queens display many of the stereotypes developed throughout the ethnographic tradition, and illustrates the concern with which Roman writers approached such powerful and seemingly paradoxical women.
Daniel Mescher

Faculty: Mesmin Destin

The Role of Identity in the Creative Process

Creativity is a talent many often find elusive. We often hear of "writer's block" preventing effective or original writing, or people claiming they are simply not "creative types" to explain creative inability. There is evidence for the latter excuse: rigid psychological personality traits such openness to experience have been positively correlated to creative performance. However, more malleable factors such as positive affect also influence creativity according to previous research. To seek further evidence of psychological influences on creative performance, the present study sought to investigate the effects of an identity-based prime on two creative performance tasks. In a laboratory setting, 84 Northwestern undergraduates were randomly assigned to read one of two similarly formatted journal articles that claimed either youth or old age to be the prime of human creativity, given that all participants were young people ranging from age 16 to 25. Modeled on identity-based motivation theory (IBM), the prime intended to enhance performance for the youth-creativity condition and hinder that of the age-creativity condition. Participants then completed the two creative measure tasks. Additionally, affect, gender, personality, and youth congruence were recorded during the experiment. Results indicate significantly better (p < .05) average scores on two of the five creativity measures (flexibility and originality), along with a significance of p < .10 for another (fluency), all while controlling for gender, openness, and positive affect as covariates. Additionally, all five scores trended towards better performance for the youth-creativity condition. These findings indicate a possible new approach to enhancing creative performance based on identity-relevant social cues.

ନ୍ଧର୍ୟ

Alok Nadig

Faculty: Carolyn Chen

From "Gender-Inversion" to "Object Choice": Reconciling Stratified Identities to Form a Coherent Political Gay Consciousness in India

In 2009, as a result of Naz Foundation v. National Capital Territory of Delhi, the High Court of Delhi in India deemed anti-sodomy legislation unconstitutional. While traditional conceptions of homosexuality in India are characterized by "gender-inversion" (the gendered presentation of an individual), the Naz decision suggests a shift to a conception based on "object choice" (the gender of the person to whom one is attracted). What have been the implications of the "gender-inversion" conception, and the shift to an "object choice" conception, on Indian LGBT advocacy in the past ten years? To answer this question, I interviewed four prominent Indian LGBT advocates and analyzed various materials from relevant organizations. My results reveal that the "genderinversion" conception has typically facilitated the prominence of gender-nonconforming MSM (men who have sex with men) at the forefront of the Indian LGBT rights movement and has yielded a plurality of identities on a gendered continuum that makes collective organizing difficult. My data also indicate that Naz, in its shift to an "object choice" conception, has facilitated more effective collective organizing among disparate LGBT groups. My results also reveal that, up until decriminalization, a crisis intervention approach had been sufficient for LGBT advocates to serve the needs of their constituents, but that moving forward past decriminalization, a rights approach will need to be adopted. Finally, my data indicate that while more gender-conforming MSM are politicizing their homosexual identities in the aftermath of *Naz*, stigma still plays a powerful role in keeping these men from doing so.

ନ୍ଧର

Elizabeth Nick

Faculty: Alissa Chung

Adolescent Coping: Associations with Age, Family Functioning and Depression

Adolescence is a period of remarkable development and stress. How adolescents cope with this stress is particularly important given that maladaptive coping strategies have been linked to psychopathological symptoms. This senior honors thesis investigated how adolescents report coping with stress and the relationships among coping style, age, family functioning and depression. By analyzing a subsample of the Stress in the Working Family Study (Emma Adam, SESP), this study found that adolescents report using adaptive coping styles, including problem solving, emotional expression, asking for help and using distraction, more often than maladaptive coping styles, which include avoiding the problem completely, ruminating and escape behaviors. Though no significant relationship was found between coping and age or coping and family functioning, there was a significant connection between depression symptoms and a number of family functioning variables, including family climate and emotional distance from one's father. Together, these variables predicted a significant portion of the variance in depression scores, confirming findings in the literature regarding the importance of family functioning in adolescents' mental health. In addition, when the sample was split by age and later split by family climate, there were significant correlations between coping and depression scores only for older adolescents and adolescents from better functioning families, respectively. As these adolescents reported more depressive symptoms, they reported using more adaptive and engagement coping behaviors. This may imply that as depression symptoms increase, older adolescents and adolescents in more supportive families are better able to draw upon their cognitive and familial resources to cope.

ନ୍ଧର

Justin O'Hare

Faculty: Ravi Allada

Genetic Analysis of Sleep and Circadian Behaviors and Volatile Gas Anesthetic Response via Forward Insertional Mutagenesis in *Drosophila melanogaster*

Despite spending approximately one-third of our lives asleep, the critical function of this highly regulated behavior remains a mystery. It is known that sleep behavior is regulated at various brain centers by the circadian clock, located in the suprachiamstic nucleus (SCN). Interestingly, anesthesia homeostatically mimics sleep; time spent under anesthesia compensates for lost sleep. Volatile gas anesthetic (VGA) action is largely uncharacterized in terms of molecular targets. Therefore, the

study of VGA response is useful not only to uncover the mechanism(s) by which VGAs bring about anesthesia, but also to elucidate its apparent relation to sleep. Genetic screens are useful in the study of multiple related behaviors as the number both of mutants generated and of behaviors screened is theoretically infinite. Here, a forward insertional mutagenesis screen of Drosophila melanogaster chromosomes II and III, using a *piggyBac* transposable element, reveals potential relationships and dissociations between the clock, sleep, and VGA response. Thus far, this screen has yielded several interesting phenotypes for the behaviors of interest. Additionally, one generated line, which was hypersensitive to both VGA and ethanol, has been identified via inverse polymerase chain reaction (iPCR) as a mutant of gene CG40045, which previously was behaviorally uncharacterized. This gene has now been named *featherweight (ftw)* and is present as an ortholog in rats and humans, coding for an E2 ubiquitin conjugating enzyme. Ongoing work includes continued production and screening of new mutants, identification of disrupted genes of interest via iPCR and DNA sequencing, and continued study of identified mutants.

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Stephen Okoniewski

Faculty: John Ketterson

Position Exchange Rates for Colloids Undergoing Brownian Motion in Narrow Channels

Single-File Diffusion (SFD) occurs when particles are confined to move in channels so narrow (quasi-one-dimensional) that they are unable to pass around each other. This concept has been used to model particle motion in a variety of physical processes, including the transport of molecules through the ion channels of cells and through microporous zeolites. However, these models idealize the real particle motion by completely prohibiting the position exchange of particles; in natural processes where the channel width is on the order of particle size such exchange may still occur. This project aims to examine the limits of the SFD model by studying the onset of this non-SFD behavior in quasi-one-dimensional electric potential channels for colloidal particles undergoing Brownian motion. To do this voltage channels are generated via interference fringes in an optical lattice formed by two laser beams; by adjusting the optical interferometer the effective width of the channels may be altered to mimic various naturally occurring channels. In order to quantitatively determine the onset of the voltage channel's width. Determining this functional relationship will enable researchers to identify when their system's behavior can no longer be modeled by SFD alone, and overall give them new insight into the strengths and limits of the SFD model.

ନ୍ଧର୍ୟ

Matthew Pilecki

Faculty: Lonnie Shea

Optimization of Lentiviral Vector Production Transfection Conditions via Physical and Active Titration Analysis for Gene Delivery in Spinal Cord Regeneration

The delivery of genes for transient expression, in applications such as nervous system injury, represents much of the current promise of gene therapy research. Prior studies have demonstrated that lentivector delivery can induce expression above controls for at least four weeks. This approach, with PLG bridges acting as a platform, is thought to be an effective way to both promote the production of factors that both stimulate axon growth and suppress the inhibitory environment. Although the principle of modifying genes to produce target proteins is simple, the engineering of reliable gene transfer vectors has proven to be a considerable challenge. The primary obstacle to the widespread application the technology is the deficiency of adequate methodologies for the development and production of high-titer viral stocks. The proportion of transduction capable viral particles typically represents only a small and variable part of those produced. Furthermore, disparate quantification methodologies have resulted in substantial fluxuations in titer determination while inconsistency in infectious activity impacts toxicity, efficacy and immunogenicity. In this study, we establish a procedure for quantifying viral transducing titer and find that qPCR represents an effective and reliable method for the quantification of virus physical titer. We also compare virus production conditions finding defined titer peaks related to cell incubation time and declines after PEG incubation times. That calcium phosphate mediated transfection demonstrated a comparability to that mediated by Lipofectamine 2000 indicated its potential as a more cost effective mediator. Ongoing studies are aimed at determining conditions which optimize calcium phosphate transfection into a protocol which balances efficiency and cost effectiveness while reducing contamination and maximizing viral titer. The study was co-authored with Ryan Boehler, Stanley Weng, Seungjin Shin, Ting He, and Lonnie Shea.

ഗ്രര

Heather Polonsky

Faculty: Diane Whitmore Schanzenbach and Elizabeth Barden

Local Wellness Policies: A Recipe for Healthy Schools?

In response to the growing childhood obesity epidemic, policymakers have recently focused on the school environment, and the ways in which school-based wellness programs and policies might reduce obesity rates. One example of a school-based anti-obesity initiative is the Child Nutrition and WIC Reauthorization Act of 2004's Local Wellness Policy (LWP) mandate. Previous research concerning the effectiveness of LWPs has yielded mixed results, and few studies have comprehensively examined changes in schools' wellness environments. To fill this gap in the literature, my research examined the impact of the LWP mandate by focusing on changes in three different areas: (1) schools' health and physical education curricula, (2) nutrition policies, and (3) Body Mass Index (BMI)-for-age rates. Data included the Center for Disease Control's "Profiles" 2006, 2008, and 2010 surveys from a weighted sample of Arkansas middle and high schools, as well as the Arkansas Center for Health Improvement statewide school-level BMI-for-age reports from

2005-2010. Analyses revealed that both before and after LWP implementation, the majority of schools had strong health and physical education curricula. However, although 93% of schools had copies of their districts' LWP, and 96% were required to report on LWP implementation, schools' nutrition policies did not change significantly, and average school-level rates of obesity/overweight actually increased significantly. These results suggest that although schools are familiar with their district's Local Wellness Policy, few school-level practices have changed, and childhood obesity rates remain high.

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Robert Porter

Faculty: Richard Morimoto

Tissue Specific Control of Organismal Proteostasis in Single-Tissue Hsp90 Knockdown

Molecular chaperones are proteins that maintain protein homeostasis (proteostasis); that is, they help fix misfolded proteins that could harm a cell. The heat shock response (HSR) is the transcription of heat shock proteins when a cell is under cellular heat stress. HSP90 is a specific heat shock protein that is a known modulator of the heat shock response; however, little is known about how HSP90 functions in a multi-cellular organism at a tissue specific and organismal level. Recent data in the Morimoto lab suggests that tissue specific HSP90 over-expression represses the organismal HSR. Thus, I have studied the complimentary effect: whether tissue specific HSP90 knock down activates the organismal HSR. Using a method of gene interference, RNAi, and a model of C. elegans (nematodes) that confers RNAi sensitivity to only single tissues (e.g. the muscle or intestine), I have found through experiments of gene expression (qRT-PCR) that tissue specific knock down of HSP90 activates the organismal HSR. Another experiment showed that RNAi mediated knockdown of hsp90 in only body wall muscle cells diminished the number of toxic aggregates in animals expressing the aggregation-prone polyglutamine proteins in their intestines. These results suggest that there might be some signaling pathway that cells use to communicate their proteostasis. I intend to further study the mechanisms and genes that may be involved with this pathway. A better knowledge of how HSP90 modulates tissue-specific and organismal proteostasis is crucial because it relates directly to diseases of protein misfolding such as cancer or neurodegenerative diseases.

ନ୍ଧର୍ୟ

Vítor Augusto Possebom

Faculty: Lynne Kiesling

Testing for Environmental Kuznets Curve within a City

An Environmental Kuznets Curve (EKC) is a theoretical relationship that states that, when income increases, environmental quality will initially decrease and, after an income turning point, it will increase again. Much research has attempted to estimate this relationship empirically using macro-level data, but little research exists that estimates the EKC using solely micro-level data. As an attempt to fill this lacuna, I use cross-sectional data from City of São Paulo at the district level and estimate the relationship between the number of contaminated areas and the percentage of São

Paulo's population that could be identified as being members of the upper and middle classes, controlling for variables related to the provision of other public goods, education, demography and housing. The results suggest that, in São Paulo, the relationship between contaminated areas and the income measure is negative for low values of income, positive for intermediate values and negative for high values. A geographical and institutional analysis can explain this pattern and allows the conclusion that São Paulo's data supports the EKC's existence.

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Morgan Purrier

Faculty: Masaya Yoshida

Online Filler-Gap Dependency Formation and That-Trace Effect

The processing of the wh-filler-gap dependency formation has a long history in the sentence processing literature. In the previous studies, it has been established that the parser does not try to posit a gap in a certain domains that are not grammatically sanctioned, the so-called syntactic islands. Compared to the online application of island constraints, little is known about other types of constraints on WhFG dependency formation. This study aims to show that the online WhFG dependency formation process is sensitive to the so-called that-trace filter: the wh-movement from right after the complementizer that is illicit in English. Assuming that the parser actively searches for the gap for the wh-phrase and if this search process is constrained by grammatical constraints, then we expect that the parser does not try to posit a gap right after that. To test this possibility, we employed the so-called Filled-Gap Effect paradigm in word-by-word moving window task. The following two factors are manipulated as the independent factors in 2×2 factorial design: Clause Type (Wh-interrogative vs. If-clause)× Complementizer (that vs. null). First, we checked the acceptability of all the sentences. A 7-point-scale acceptability rating task revealed that all the stimuli show the equal acceptability (Fs<1). The results of the moving window revealed that the embedded subject pronoun is read significantly faster compared to all the other conditions (there was a significant interaction of Clause Type × Complementizer). The results suggest that the parser did not try to posit a gap right after the complementizer that: the that-t filter was respected by the online WhFG dependency formation process. Therefore, like other island constraints, the parser respects a constraint on WhFG dependency formation.

ഗ്രരു

Benjamin Ratskoff

Faculty: Laurie Shannon

Resistance and Privilege: Organic Agriculture and Localism Encounter Inheritance

The two owners of *La Ferme de Jacquou* are expressly committed to organic farming and localism in order to resist dominant business and government practices of industrial agriculture they find environmentally unsound and morally wrong. However, the acquisition of the farm's land space through inheritance situates this form of everyday resistance within privilege, since inheritance is a central mode through which wealth inequalities persist. This study attempted to understand the

possibilities (and limitations) of everyday resistance while existing, and participating, in privilege. Drawing from the works of James C. Scott and Cathy J. Cohen, this study understood everyday resistance as intentional behavior meant to challenge or defy the normative actions of those with power while avoiding any direct confrontation with them. The farmers' white, French identities offer them agency and autonomy to participate in this resistant behavior, positioning the behavior beyond the level of deviance. I immersed myself in this farm's culture for a period of eight weeks, examining how the farmers' personal ideologies were expressed through their actual practices and choices as farmers, merchants, and consumers. The insight gained from this research sheds light on how individuals negotiate the tension between resistant behavior and privileged existence.

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Michael Reiner

Faculty: Kathryn Kalscheur

Comparing Renewable Energy Sources in Rural Ecuador

This research project conducted a cost-benefit analysis on 3 low-cost, renewable energy sources in rural Ecuador. The three systems analyzed in this research were a biodigester, which converts cow manure to cooking gas, solar panel, and system that heated water through plastic bottles. The aim of the project was to determine which renewable energy system was the best investment and why. This research could be used to advice other communities on worthy energy projects to engage in. The research was interpreted through a cost-benefit analysis. The first phase of the project was to collect data on each of the three systems. This phase involved using methods such as measuring manure inputs and testing water temperatures. After sufficient data was collected, calculations were made to determine present worth balances and payback periods. Lastly, each system was evaluated to see if any adjustments could optimize their efficiencies. The results concluded that the biodigester provided the best value, although the plastic bottle system could produce similar paybacks, with a smaller initial investment. The project went on to study how the locals acknowledge the benefits of these systems. This research is yet another way of interpreting the importance of renewable energy sources.

ഗ്രര

Ellen Reynolds

Faculty: Robin Nusslock

Individual Differences in Reward Related Processing: A Study of Event Related Potentials

Psychological research has shown significant individual differences in how we experience rewards, and extreme sensitivity and insensitivity to reward are key characteristics of several mood disorders. This study investigated how individual differences in reward sensitivity are represented in the brains of healthy individuals, and whether or not levels of self-reported reward sensitivity can be connected to specific brain activities. Participants who scored especially low or high on a measure of reward sensitivity completed a computer task in which they had to differentiate real words from non-words.

Real words were positive and reward-related, negative, or neutral. During the task, participants' brain activity was measured using event-related potentials (ERPs), a technique which uses electrodes on the scalp to identify spikes in brain activity in the milliseconds after the presentation of a stimulus. We also measured participant's reaction time to each stimulus. We hypothesized that individuals would have a greater reaction to positive words than to other words, both in terms of reaction time and the strength of the ERP signal. Also, we predicted that those who reported a strong sensitivity would have a greater reaction to the rewarding words than the low sensitivity group. Results showed that while the high group did have higher responses than the low group across all valences, they unexpectedly reacted more to negative than to positive stimuli. In the future, understanding the relationship between ERPs and reward sensitivity in healthy individuals may help inform the study of those with mood disorders who show similar patterns of sensitivity.

ନ୍ଧର

Anna Rhoad

Faculty: Karl Rosengren

Grasping Errors in Preschoolers and Adults

Inhibitory control is the ability to control and monitor thoughts, actions, and emotions and is important for school readiness. The goal of this project was to explore grasping errors, a type of action errors, as an early indicator of inhibitory control which would allow us to identify children that are likely to have inhibitory control difficulties at a young age. When making action errors, children attempt to act on objects that will not enable the action to be successfully performed. Another form of action errors, known as grasping errors, occur when young children and infants attempt to grasp at objects shown in pictures. Grasping errors may be a result of infants being unable to inhibit their desire to act on the photograph. Participants were 30 adults (used as a control group) and 40 preschoolers. A delay of gratification task was used to measure inhibitory control and children were left in a room with a desirable treat (such as candy or pretzels) and told that if they waited to eat the treat until the experimenter returns they would receive more of it. In order to elicit and measure grasping errors, I used a go/no go paradigm where participants were asked to grab the stimuli only if they are real objects and told to not reach for the stimuli if they are photographs of objects. Results indicated that participants made grasping errors under time pressure. I was also able to look at the relationship between inhibitory control and grasping errors.

ନ୍ଧର୍ୟ

Nora Richter

Faculty: John W. Hayse, Argonne National Laboratories

Programming an Assessment Tool to Evaluate Environmental Performance of Regulated Rivers

The U.S. Department of Energy encourages existing hydropower facility operators to evaluate environmental impacts of power generation in day-to-day and seasonal operations. To objectively quantify the impacts of reservoir operations on downstream ecosystems, a computational tool is being developed. The tool is based on relationships among certain parameters such as discharge, temperature, and dissolved oxygen and the ecological and physical concerns within the channel and adjacent riparian areas. A prototype was developed in Microsoft Visual Studio using C# providing an interface for the user to download site-specific instantaneous raw data and store processed data at various timescales to MySQL database. The user has the ability to select an assessment date and module for evaluation of either past performance or optimization of future operations based on water availability. The user then identifies a suite of environmental objectives and tracks their accomplishment for a specified duration, time period, and frequency. For each objective, the constraints and scoring system set by the user are used to query the database at a specified timescale. From this, a weighted score is calculated using embedded formulations and mathematical relationships established from scientific literature. Once all individual objectives are evaluated, an overall environmental performance score or "index of river functionality" value, between 0 and 1, is calculated. A score of 0 indicates that conditions for one or more objectives were not met. However, a score of 1 indicates that all environmental requirements were fully satisfied, with intermediate values indicating partial fulfillment. This tool will be tested using information gathered from regulated sections of the Feather River in California and the Gunnison River in Colorado. This tool can be incorporated into an optimization model to assist with the identification of alternative scheduling and operating procedures for hydroelectric power plants to enhance revenue while simultaneously reducing environmental impacts. This work is co-authored with John W. Hayse, Samrat Saha, and Mark Jusko of Argonne National Laboratories.

ନ୍ଧର୍ୟ

Felix Richter

Faculty: Vinayak P. Dravid

Magnetic Nanostructures for Potential Cancer Theranostics

Magnetic nanostructures (MNS) are a class of promising theranostic agents by virtue of their unique applicational approaches, such as magnetic resonance (MR) imaging and thermal ablation. Furthermore, MNS can be functionalized for selective surface recognition elements for *in vitro* and *in vivo* targeting, diagnosis, and therapy. Here we describe a new methodology for iron oxide nanostructure surface functionalization and applications thereof. Specifically, due to the extraordinary stability of the new MNS in all types of biological media and their elevated R₂ contrast for MRI they are a promising new agent for cancer theranostics. Cellular incubation of MNS was characterized with transmission electron microscopy, showing that MNS reside in vesicles throughout the cell. *In vitro* cellular studies with U251 human glioblastoma, UT197 bladder cancer, and MDA-MB-468 Human Breast Cancer cells demonstrated that the MNS are nontoxic at elevated concentrations and exhibit a high efficacy in thermal ablation therapy. This work is co-authored with Mrinmoy De, Stanley Chou, and Vinayak P. Dravid.

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Elisabeth Rivard

Faculty: S. Hollis Clayson

The Professional Life and Politics of James Gillray: Satirical Caricature of the Georgian Era

Throughout the reign of King George III, Great Britain was the site of a flourishing trade in satirical caricatures, the predecessors of modern-day political cartoons. My honors thesis in art history explored the life and work of James Gillray (1756-1815), the genre's foremost practitioner. Though Gillray's caricatures satirized a range of highly topical affairs in late Georgian Britain, understanding of his own politics is quite limited. Numerous politicians hired Gillray to produce caricatures, and for a time, he even enjoyed a full government pension. Given these circumstances, interpreting Gillray's true motivations has been an enduring issue. I hoped to find evidence that would complicate the traditional characterization of Gillray as a mere "hired gun". With the support of an academic-year URG, I traveled to London to research Gillray's correspondences with his patrons and publishers. I concluded that although Gillray was subject to external influence and commissions from the Tory party, he denied their complete control and dictation. In fact, based on his original letters and a review of the caricatures themselves, Gillray valued the integrity of his artistic practice, and refused to lower himself to mercenary status. It remains true that the majority of Gillray's caricatures take a "pro-Tory" tack, but his alleged conversion to conservative politics cannot be explained by his pension or his affiliation with the Tory party. My thesis endeavored to present a more complex and nuanced portrait of Gillray, as one of the most remarkable satirists of the Georgian Era.

ନ୍ଧର୍ୟ

Kristina Rodriguez

Faculty: Darren Gergle

Linguistic Markers for Aphasia in Online Communication

Aphasia is an acquired language disorder that impairs the ability to speak, read, write, and understand others. Its impact has been studied extensively in spoken and written communication. However, there is scant research on its manifestation in computer-mediated communication (CMC) media such as e-mail and online forums. In this study we asked whether the well-documented language deficits associated with aphasia could be detected in online writing of people with aphasia. We analyzed 150 messages (14,754 words) posted to an online aphasia forum, by six patients and by four controls. Our results revealed significant linguistic differences between the patients and controls. Consequently, we suggest five linguistic markers for aphasia in CMC: mean length of utterance (MLU), ungrammatical sentences, morpheme inflection errors, open class word errors, and closed class word errors. These preliminary findings have theoretical and applied implications for the development of technology -based methods for identifying and monitoring deficits in patients with conditions such as aphasia. The interdisciplinary nature of this research and the results enhance our knowledge and understanding of CMC and aphasia. Additionally, the prevalence of technology in communication lends these CMC markers a unique capacity in clinical assessment. They provide clinicians with more sources of language assessment that are unobtrusive, naturalistic, and comprehensive. The accessibility of CMC media also provides potential for longitudinal monitoring to enrich patient histories.

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Emily Roskey

Faculty: Wendi Gardner

Self-Identity and Global Concern in University Students

This study tested the hypothesis that breadth of self-identity, or the extent to which people identify the self at the broadest level of shared group memberships, is associated with greater concern for global climate change in students in Bologna, Italy. It has been found that a greater breadth of selfidentity in University students results in greater concern for environmental issues. Italians in specific are high in both breadth of global identification and environmental concern, therefore breadth of self-identity and strong global identification in Italy might explain the high environmental concern. The association between breadth of self-identity and environmental concern had not yet been studied in a context outside of the United States. This study took place at Universita di Bologna in Bologna, Italy. Methods included a short experiment and brief structured interviews. The experiment included questions about naturalistic self-identity, the Allo-inclusive Identity Scale, and a measure for environmental concern. The sample size for the experiment was 34 Italian students. The structured interviews were conducted with 17 separate participants at each site and inquired about the complexities of self-identity concept and its context in global climate change. This research informs the growing body of work examining breadth of self-identity and identity flexibility as it relates to collective good concerns.

ନ୍ଧର୍ୟ

Melissa Rothman

Faculty: Elisa Baena

The Paris of Latin America ¿Sos Bienvenido?

In a group project funded by an Undergraduate Research Grant, Jacklyn Giannitrapani and I investigated the urbanization of a squatter settlement in Buenos Aires known as Villa 31. Villa 31 has existed in Buenos Aires for over 80 years despite attempts to eradicate it and relocate the residents. In 2009 the Buenos Aires government approved a new plan for urbanizing and formalizing the villa. Even though the plan passed, many separate groups have a vested interest in keeping the villa informal. I specifically investigated the cultural boundaries between the villa and Buenos Aires. There is an incredible stigma for living in a villa connected to the residents' race, class, and nationality that is a powerful force separating the villa residents and Buenos Aires residents. This divide in combination with other financial benefits from keeping the villas around makes it unlikely that any urbanization plans will successfully be put into action in the near future.

Bill Russell

Faculty: Burton A. Weisbrod and Mark Witte

Dr. Wildcat: Explaining Decisions to Go to Graduate School after Northwestern

My paper addresses the increasing concern about student debt in the U.S. by analyzing its role in students' decisions about attending Ph.D.-level graduate programs. I utilize data from the Northwestern University Senior Survey in 2008, 2009, and 2010 to address this question, and I supplement it with data from the Northwestern University Career Services Survey to include the role of potential earnings in my analysis. I also control for a variety of other factors, such as sex, citizenship, parental education and income, and a variety of academic factors. I find that debt does not play a significant role in graduate school decisions. Large potential earnings do impact decisions to go to graduate school, but only in the long run. Finally, I find that conducting research with a faculty member is the most significant academic indicator that a student will go to graduate school.

ମ୍ଚର

Patrick Schnettler

Faculty: Selim Shahriar

Encoding the Polar Logarithmic Transforms (PLT) of Images Using a Virtex-6 FPGA and a Logarithmic Amplifier

Dr. Selim Shahriar is currently working on a project titled "Ultrafast Automatic Target Recognition (ATR) System using a Hybrid Holography-VLSI Correlator Invariant under Shift, Rotation and Scaling." The goal of this project is to realize an ultrafast ATR with a correlation speed of a few microseconds per database image. This is nearly three times faster than the current alternative: using DSP chips. The use of Polar Logarithmic Transforms within the system will give it the unique ability to perform 2D Fourier Transforms automatically, rendering the correlator insensitive to spatial shift, angular orientation and scaling. My role in this project has been to develop, test, and optimize techniques to encode the PLT of images using a Virtex-6 FPGA board and a logarithmic amplifier. To do this I followed the following steps: 1) Wrote MATLAB code to familiarize myself with the properties of Polar Transforms 2) Explored CORDIC algorithm and functions of Xilinx's Core Generator Tool. 3) Translated the MATLAB code to VHDL using Core Generator Logic blocks. a) Created a VHDL function to convert Cartesian coordinates to polar coordinates. b) Looped this function for all coordinates in an image. c) Implemented a logarithmic transform on the radial coordinate. d). Developed a system to test images using the on-chip memory of the FPGA. e) Replotted the image with ϱ on the horizontal axis and θ on the vertical axis.

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Benjamin Segal

Faculty: Alvin Bayliss

Pattern Formation in a Model of Competing Populations with Nonlocal Interactions

My research is on a problem in the evolution of competing populations with a nonlocal coupling. This involves a system of integro-partial differential equations. In typical population models, the rate of change of the population depends on local properties, i.e., the rate of change of a population at a point x depends only on the behavior in a small neighborhood of x. My model involves systems where the rate of change of the population depends on nonlocal properties, i.e., integrals of the competing populations over a large neighborhood of the point x.

ନ୍ଧର୍ୟ

Sharona Sernik

Faculty: Regina Logan

The Effect of Jewish Religious Observance on College Women's Perceptions of Marriage

This study seeks to understand varying perceptions of marriage among Jewish college women. Through interviews, the researcher explored how varying religious observance in three groups of Jewish women affect their perceptions, plans, and expectations of marriage. The three groups studied were: secular women, who identify as Jewish but are not highly observant; *baal teshuva* women, who did not grow up in religious homes but have chosen to become observant; and women born to religious homes, who have been religious their whole lives. The researcher found several similarities and differences among the groups. The most similarities were seen between the *baal teshuva* and the religious from birth women, since marriage is highly tied to their religious beliefs and practices. The main differences seen were thus due to differences in religious observance. The research shows how recent changes in marriage and in the transition to adulthood are mostly applicable to non-observant young women.

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Ki Eun Shin

Faculty: Richard Zinbarg

Having Therapy during Sleep? Improving Extinction Learning for People with Blood-Injection-Injury Fears by Rehearsing Memories during Sleep

Exposure therapy involves patients' learning to associate the feared stimuli with absence of negative outcomes. Despite confirmed efficacy, patients tend to find exposure aversive and have difficulty complying with the treatment. One method of addressing this problem is to enhance therapeutic learning by capitalizing on the memory consolidation that occurs during sleep. Previous research demonstrated that memory can be enhanced by presenting sounds associated with the learned material during sleep. The current study examines whether presenting sounds associated with

therapeutic information during sleep leads to greater symptom reduction than exposure alone. Fourteen participants with blood-injection-injury fears were selected based on the Mutilation Questionnaire scores and a structured clinical interview. Participants viewed 12 pictures related to blood-injection-injury fears, and their anxiety, physical sensations, and looking time were measured. Participants then completed an exposure session and reflected on positive lessons they gained from it while listening to a piece of music. Half the participants listened to the music during their sleep for one week. Participants returned after one week participants viewed the same pictures again. Although not significant, the changes in ratings of anxiety and physical sensations were in the direction of superiority for the sleep rehearsal condition, t(9) = -.98, p = .35; t(9) = -1.59, p = .15. The result suggests that perhaps one may be able to augment exposure therapy via cued rehearsal of therapeutic learning by presenting associated sounds during sleep.

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Devin Sizer

Faculty: Kate Masur

Straddling Spheres: Gender Ideologies and the Political Resistance of Southern Unionist Women of North Carolina

Although popular history generally portrays Southerners as reacting joyously to the establishment of the Confederacy in 1861, large numbers of Southerners opposed secession and maintained their loyalty to the Union during the Civil War. These Southern Unionists often participated in active resistance of the Confederacy, and women occupied vital roles in Southern Unionists' subversive activities. Southern Unionist women's behavior during the war frequently broke with existing expectations of their gender. Historians have illustrated that, as female Unionists became important and militant partisans in opposition to the Confederacy, Confederate authorities were forced to accept that women were acting outside of their assigned sphere, and Confederates began to treat women as political actors. My paper, however, examines a question that these historians have overlooked: how the men and women within Southern Unionist communities understood Unionist women's behavior. My research focuses on the records of the Southern Claims Commission, in which Unionists sought to prove their loyalty to receive reimbursements for wartime property losses. My study reveals that, by the end of the war, many Southern men and women had come to regard Unionist women's speech and actions as political. The war made fluid the border between the private and the public, the domestic and the political, and weakened the ideological walls that kept women away from the sphere of partisanship and power. The stories of Southern Unionist women exemplify war's power to transform the relationships between men and women, and the conflicting ways that individual men and women react to these changes.

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Peter Skopec

Faculty: Ian Hurd and Andrew Roberts

Round the Corner, Not Over-the-Hill: How a Changing International Threat Environment at the End of the Cold War Triggered NATO's Vital Transformation

This paper examines the impact of a changing international threat environment at the end of the Cold War (1987-1992) on relations within the Atlantic Alliance. As the Soviet Union collapsed in the late 1980s and regionalized conflict replaced large-scale superpower confrontation as the primary threat to international security in the early 1990s, NATO allies were driven to cooperate more closely in managing risks to transatlantic stability. A three-dimensional conceptualization of cooperation and discord within NATO that accounts for 1.) *Alliance members' engagement in joint military missions*; 2.) *the perceived (un)fairness of allies' economic contributions to NATO*; and 3.) *policy (dis)agreement among NATO members* reveals that, contrary to common belief, relations within the Alliance grew relatively more cooperative, rather than less cooperative, throughout the late 1980s and early 1990s. A neorealist model that judges perceived external threat by examining the *perceived urgency of threat*, and that rejects perceived force levels as the measure of perceived external threat, will accurately explain the increase in intra-NATO cooperation between 1987 and 1992; this model more effectively captures the influence of the changed, post-Cold War threat environment on intra-Alliance relations than traditional neorealist, institutionalist or pluralist hypotheses for intra-alliance behavior do.

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Mike Sladek

Faculty: Renee Engeln-Maddox

Mood Affects Frequency of Negative Body Talk in College Women

"Fat talk," a term coined by Nichter and Vuckovich (1994) to refer to women speaking negatively about their bodies, is a normative phenomenon among college women. This study examined the effects of different moods on college women's likelihood of engaging in negative body talk/fat talk through self-report items and an experimental design. Participants were asked how different mood states (e.g., happy, confident, socially excluded) would influence how likely they would be to say something negative about their body on a scale from 1 = makes me less likely to say something negativeabout my body to <math>5 = makes me more likely. Participants self-reported that negative moods would make them more likely to engage in fat talk. In a follow up experiment, participants were randomly assigned to one of four conditions involving an autobiographical writing task designed to manipulate mood: confident, negative nonsocial control (i.e., failing academically), rejection, or control. Participants completed the Negative Body Talk (NBT) scale following the writing task. Analyses demonstrated that scores on the NBT for participants assigned to the confident condition were significantly lower than scores for the control condition, F(3, 130) = 1.68, p = .04, $\eta_p^2 = .04$. Experimentally inducing confidence decreased fat talk but there was no evidence that inducing a negative mood increased fat talk.

Maggie Sledd

Faculty: Robert Holmgren

A dsRNA Based Screen Identifies Novel Proteins Involved in Drosophila Hedgehog Signaling Pathway

A screen has been performed identifying potential novel members of the Hedgehog (Hh) signaling pathway. The Hh signaling pathway is responsible for the patterning of many different organs during development. In mammals, aberrant Hh signaling is associated with a number of different cancers, including basal cell carcinoma and prostate cancer, and therefore, a further understanding of Hh could lead to new treatments. While many proteins involved in the Hh signaling pathway have been discovered, there are still many that remain unknown. In Drosophila melanogaster, the Hh signaling pathway is responsible for the patterning of the wing, so a UAS-Gal4 RNAi screen was devised using the MS1096-Gal4 driver to specifically knock down gene expression in the wing. The screen was performed in a sensitized *fused* (fu^{\dagger}) mutant background, looking for both suppressors and enhancers of the fu' phenotype. By observing wing vein patterning, it was possible to determine whether loss of a particular gene had a significant effect on Hh signaling. Thus far, the screen has covered 11% of the Drosophila genome. Out of 1590 genes, 29 were strong enhancers and 11 were suppressors of the fu^{\prime} phenotype. Several of these hits were followed up using RNAi in larval wing discs and visualizing gene expression with immunofluoresence. One gene of particular interest, *megator (mtor)*, was a strong enhancer of the fu' phenotype. Knockdown of *mtor* with RNAi resulted in a decrease in expression of the Hh target genes decapentapleigic and collier. Future research will include looking for genetic interactions with a mutation in the endogenous mtor gene to validate its involvement, and elucidating the function of Mtor in the Hh signaling pathway.

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Eric Nathan Smith

Faculty: William Revelle

Gender and Occupation: More Than Meets the Eye

Although various studies have suggested that measurable individual differences may predict future occupation, few studies have directly examined the relationship between personality traits, vocational interests, and gender that may all influence the likelihood of certain occupational choices. This study attempts to weave these factors into a cohesive model of occupational choice through an online survey of incumbents in 585 distinct occupations combined with national statistics from the US Department of labor (DOL). In addition, the present study introduces a new survey instrument developed from the DOL Occupational Network (O*NET) database work styles. We find in this large-scale (N>10,000) online survey that gender differences in occupation are in part due to gender-specific traits, interests, and abilities that are attracted to certain occupations regardless of gender.

Bryant Smith

Faculty: Melville Ulmer

Cluster Odd-Balls: Examining Peculiarities in Galaxy Clusters

"Clusters" of galaxies are the largest gravitationally bound systems in the universe. We study clusters because, in addition to their being interesting in themselves, their origin and evolution can tell us a lot about cosmology. My research at NU has primarily concerned examining cluster "odd-balls"--clusters that don't quite seem to fit the rules--through data-mining and analysis. For example, cross-correlating known X-ray sources (XMMSSC Catalog) with clusters discovered through optical algorithms (GMBCG Stripe 82 Catalog) yielded a subset of clusters that are too X-ray hot for their mass. Why? Perhaps these are a class of dark-matter heavy clusters. A pending Chanda satellite proposal we submitted to get a better look may give us more answers. Further examples are considered that not only provide potential insight into galaxy clusters, but that illustrate the practice of pursuing anomaly and peculiarity in science.

ନ୍ଧର

Emily Srisarajivakul

Faculty: Jinah Kim

Hallyu - Korean Popular Culture's Effects on the Perceptions of Masculinity, Interracial Dating, and Intraracial Dating Practices among American Students

Hallyu, or the "Korean wave," is a force of cultural globalization; the popularity of South Korean dramas and South Korean pop songs (k-pop) in has risen in practically every country in the world. But what does this undeniably South Korean construct mean for Asian Americans? This project explores perceptions of Asian American male masculinity and the perpetuation of stereotypes of Asian American males by mainstream American society through comparing the behaviors and opinions of university students who subscribe to Korean dramas and k-pop with students who do not. Additionally, this paper explores whether the images presented by the Hallyu phenomenon is affecting race-based dating practices among American youth.

ନ୍ଧର

Christina Stallknecht

Faculty: Carolyn Chen

If I Can't Dance I Don't Want Your Revolution! Dance in the Occupy Wall Street Movement

Since September 17, 2011, the Occupy Wall Street movement has organized demonstrations in the financial district of New York City. One unique part of these protests is the presence of spontaneous, vernacular, rhythmic dances, which I refer to here as Accessible Community Dance. In this research study, I have investigated what function these moments of dance serve in the protest as a whole. To this end, I completed 6 interviews with participants and witnesses of the dances, did

movement analyses of 30 videos of dancing at Occupy Wall Street, and closely followed materials released by Occupy Wall Street supporters and organizers. Based on the data collected in this project, I have concluded that Accessible Community Dance of the Occupy Wall Street movement serves several functions: to contribute to a collective group identity among protestors, to aide in the creation of symbolic boundaries between protestors and nonprotestors, and to help protestors sustain enthusiasm in their cause. My research demonstrates that more work is necessary to determine if Accessible Community Dance acts as a form of resistance in and of itself in the Occupy Wall Street movement. Finally, this research illustrates that the meaning of dance in protest should not be generalized. Researchers must look closely at the type of dance present and how it relates to the particular historical and geographical context in which it takes place, paying close attention to how protestors themselves make meaning of participating in and witnessing dance.

ନ୍ଧର୍ୟ

Daniel J. Stevens

Faculty: Vicky Kalogera

Interpolation Techniques for MCMC Parameter Estimation on Compact Binary Coalescence Gravitational-Wave Signals

With gravitational-wave detection on the horizon, astronomers look for ways of extracting useful information from a detected gravitational wave. Like its electromagnetic cousin, a gravitational wave carries important information about the characteristics of its source, and these characteristics can be recovered through numerical analysis. Using one promising technique known as a Metropolis-Hastings Markov Chain Monte Carlo (MCMC) simulation, astronomers can produce a probability distribution over an entire parameter space describing gravitational wave signals; given the gravitational wave data, the MCMC produces a sequence of parameter samples whose distribution converges to the probability density on parameter space implied by the data. Although an MCMC simulation will produce the equilibrium probability distribution in an infinite amount of time, a simulation that runs for a finite amount of time may not. This work focuses on using a kD-tree sorting structure to improve MCMC sampling. We show that a simple sampling method effectively recovers an accurate probability distribution in two dimensions but performs worse than a noninterpolated run in nine dimensions. We explain how dimensionality issues and correlations between the nine parameters – which are not taken into account by the simple sampling method – can cause the simple sampling method to yield inaccurate distributions, and we compare these results to those from an interpolated MCMC simulation with a more sophisticated sampling method which takes correlation into account. Improving the convergence of an MCMC simulation through interpolation would allow for faster, more frequent analysis of gravitational wave signals as well as higher confidence in recovered probability distributions.

ഗ്രര

Susan Sun

Faculty: Stuart Wagenius

Abnormal ChromosomeX Methylation in Breast Cancer

Tumor heterogeneity is a major challenge for cancer diagnosis and treatment, and better characterization of an individual tumor is essential for individualized medicine. In women's normal cells, one of the X chromosomes is deactivated. Abnormal inactivation or loss of the inactivated X chromosome is implicated in X-linked diseases and women's cancer. To gain a better understanding of this abnormality and its implication in cancer, I looked at chromosome methylation percentage on the C residue of over 11,000 CpG sites for 16 breast tissue samples (8 normal and 8 breast cancer) with data obtained from high density methylation microarray chip . Through various multidimensional, parametric and non-parametric tests, it was observed that there is a significant difference between methylation of breast cancer tissue DNA residues and methylation of normal tissue DNA residues.

ନ୍ଧର

Joshua Swenson

Faculty: Dan McAdams

Faith Development and Personality: Faith Development, Openness to Experience, and Ego Development

This study examines relationships between personality and religious faith development in a sample of 126 religious adults. Interviews about the semantic and episodic domains of religious life were coded according to Fowler's (1981; Fowler et al., 2004) theory of Faith Development. Personality was examined through Big 5 traits and Ego Development. The semantic and episodic domains of religious faith were highly correlated in terms of the faith stages apparent in them, with beginning points in religious faith indicative of participants' current faiths stages. It was found that Openness to Experience and Ego Development were both positively correlated with higher stages of Faith Development. When considered alongside Openness to Experience and Social Class, an index which included annual family income and years of education, in a multiple regression analysis, Ego Development was no longer predictive of Faith Development. The results are discussed with regard to the Faith Development theory and process.

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Jessina Thomas

Faculty: Teresa Woodruff

Impact of Gleevec on Fertility Preservation for Cancer Patients

Although radiation and chemotherapy effectively fight cancer cells, they also have damaging effects on ovarian follicles, the functional unit of the ovary. Few options for fertility preservation are available for young women before they receive chemotherapy. These methods are invasive, involving the removal of an ovary. As a result, the purpose of this study was to explore the interactions between two chemotherapeutic drugs, Gleevec and cisplatin. Cisplatin effectively kills cancer cells through activation of the p63 pathway, leading to apoptosis, programmed cell death. However, cisplatin can also damage early-stage ovarian follicles, or primordial follicles, which are crucial to a women's fertility. In a recent study, Gleevec, a cancer treatment drug, prevented cisplatin-induced primordial follicle loss in adult mice ovaries after brief treatment with both drugs. Thus, we treated ovaries in vitro with different concentrations of Gleevec. Follicle counts were performed to determine if follicles were rescued from cisplatin-induced cell death by blocking an apoptotic signaling pathway. Our results showed that Gleevec rescues primordial follicles from cisplatin- induced death in mouse ovaries that were cultured, indicating that Gleevec could be a possible fertoprotective agent.

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Liuchuan Tong

Faculty: Regan Thomson

Progress towards the Total Synthesis of Maoecrystal Z

Historically, many natural products, like Taxol, Penicillin, Morphine, etc, have proven to show anticancer, anti-bacterial activities and greatly improved the human health condition. Maoecrystal Z, a natural product recently isolated, showed anti-cancer activity towards several cell lines such as K562 (leukemia), MCF7 (breast), and A2780 (ovarian) cell. Despite the enormous potential use of this molecule, the limited amount available from the natural source severely restricts further investigation. At best, 1.1 kg of dried, powdered *Isodon eriocalyx* leaves yield only 8 mg of Maoecrystal Z (0.00073% by mass). The inefficiency of natural acquisition demands an innovative synthetic method to produce this molecule and the designing a scalable synthesis is difficult because of its strained carbocyclic core and its 7 stereogenic centers. The short term goal of this research is to develop a concise, efficient total synthesis of maoecrystal Z and the strategy should be applicable to its structurally related diterpenes such as macrocalyxoformin E. Here, we report a convergent, enantioselective synthesis route to the common precursor of both maoecrystal Z and macrocalyxoformin E, employing a Nozaki-Hiyama-Kishi coupling reaction followed by Nazarov cyclization as key stereogenic and ring forming steps. This research is co-authored with Benjamin J. Moritz.

ନ୍ଧର

Sarah Topol

Faculty: John Wynne

"Good Grief!" Cicero, Grief, and the Stoic Critique of the Emotions

The Stoic Critique of the Emotions has long been an interesting and vexing part of their overall theory. Cicero is one of the main ancient sources philosophers turn to for evidence of the details of Stoicism. Interestingly though he expresses several other ideas, in direct contrast to Stoic beliefs,

about grief and its compatibility with wisdom, particularly in his *Laelius de Amicitia*. My thesis explores the Stoic Critique on Emotions, focusing on the idea of grief, and presents Cicero's contrasting views on the subject. Ultimately I conclude that grief is a necessary consequence of friendship and is therefore compatible with wisdom.

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Kathleen Trocin

Faculty: Rebecca Seligman and Helen Schwartzman

A Woman's Defense: Narratives of Suffering among Bolivian Women and Health Workers Surrounding Biomedical Contraceptive Use

The use of biomedical contraception has long been a contentious issue in Bolivian society. With the recent development of the indigenous political movement and increased promotion and popularity of "natural" indigenous life ways and medicinal practices, the use of biomedical contraceptives in Bolivia is now even more complicated. This thesis explores how narrative can be employed as a tool with which to negotiate the meaning of biomedical contraceptive use in this particular cultural context. Ethnographic data drawn from 18 semi-structured interviews with women, their health workers, and traditional medicine practitioners conducted in March and April 2011 in La Paz and El Alto, Bolivia suggests that a shared discourse explaining biomedical contraceptive use among women and their health workers is emerging. This narrative that centers around how women's unregulated fertility leads to "suffering" may challenge the idea that women's reproductive lives led according to traditional ideals are "natural," and ultimately has to potential to redefine traditional expectations of womanhood and motherhood. As women employ this narrative of "suffering," spaces for negotiation may be created, leading to transformations in gender roles and responsibilities in their personal relationships. On the macro-social level, the narrative may justify women's departure from indigenous norms and reimagine indigenous gender ideologies surrounding "naturalness." This thesis will ultimately provide insight into how Bolivian women interpret and negotiate the use of certain reproductive technologies in a medically plural environment and more broadly demonstrate how narratives surrounding illness and medical choices can be employed to construct both personal and social identities.

ഗ്രര

Kayla Viets

Faculty: Jason Brickner

Identification of a Gene Recruitment Sequence in the GAL1 Promoter

Incorrect gene transcription has been linked to many different human diseases. An understanding of the mechanisms that contribute to gene transcription would assist in understanding and potentially treating these diseases. A gene's expression can be affected by its position within the nucleus of a cell. Specifically, a gene's location either at the nuclear periphery or in the nucleoplasm may affect its transcription and expression. In the model organism *Saccharomyces cerevisiae* (brewer's yeast), whose genome bears many similarities to that of humans, some genes are directed to the nuclear periphery

via DNA signals called Gene Recruitment Sequences (GRS elements) which are located in gene promoters. The Brickner lab has already identified GRS elements for the yeast genes INO1, TSA2, HSP104, and ACT1. However, the mechanisms controlling the localization of other yeast genes such as GAL1, a well-studied, sugar-responsive gene, are not well understood. My research project seeks to identify the DNA elements responsible for targeting GAL1 to the nuclear periphery in yeast. I have determined that the GAL1 gene has two small, cis-acting GRS elements upstream of its start site in its promoter region. The results of my project will assist in future experiments to identify the proteins involved in GAL1 recruitment and to understand the general molecular mechanism for gene recruitment to the nuclear periphery. My research will also contribute to our understanding of how peripheral targeting affects gene expression.

ഗ്രര

Mahima Vijayaraghavan

Faculty: Amy Paller

Loss of Ganglioside GM3 Synthase Prevents Glucose-Induced Suppression of Keratinocyte Migration

Wound healing is a complex process that requires migration of keratinocytes - predominant cells of skin. Impaired wound healing is a significant problem for diabetics. Previous studies suggest that ganglioside GM3, a molecule that regulates signaling and cell communication, is a critical intermediate in insulin resistance. The Paller laboratory has shown that GM3 levels are increased diabetic mouse skin. Furthermore, wound healing impairment in mice with diet-induced obesity is fully reversed by knockout of GM3 synthase (GM3S). We studied the impact of ambient glucose excess and GM3S knockdown in GM3S^{-/-} mouse keratinocytes to assess the effects of keratinocytespecific GM3S depletion on wound healing. As predicted, wildtype (WT) keratinocyte migration virtually ceased in the presence of 12 mM supplemental glucose (hyperlycemia) simulating impaired wound healing in diabetics. However, migration of GM3S^{-/-} mouse keratinocytes in *in vitro* wound healing assays was not only greater than that of WT keratinocytes in normal glucose concentrations, but was increased further in the presence of the hyperglycemia. To dissect how GM3S affects migration, live cell imaging was performed. GM3S^{-/-} mouse keratinocytes migrated faster and farther than WT cells, particularly in the presence of hyperglycemia. Although hyperglycemia prevented lamellipodia formation and eliminated polarity in WT cells, unidirectional lamellipodia were more numerous in GM3S^{-/-} cells, and even more so with hyperglycemia. Migratory patterns of human keratinocytes, treated biochemically to reduce GM3, mirrored those of mouse GM3S^{-/-} keratinocytes. These findings suggest that GM3 suppresses keratinocyte migration during wound healing and raises the possibility of GM3S-suppressive therapy for diabetic wounds.

ഗ്രര

Rafael Vizcaino

Faculty: Penelope Deutscher

Re-Thinking Foucault's Relation to 'Power': Semantics, Fetishization, and Political Consequences

My project offers a new reading of Michel Foucault's conception of 'power.' I argue that to think of 'power' as a generic concept without any direct overseeing control, as I think Foucault implicitly does by the time of his *History of Sexuality Volume One*, has disastrous political consequences. I will argue that to think of 'power' in this (universal) way, as Power, is to fetishize (particular) power. Thus, I propose a semantic differentiation in Foucault's concept of 'power' that would allow theorists to be as explicit as possible when using this concept – in both the particular and the universal forms. I conclude that in order to avoid the aforementioned disastrous political consequences, 'power' must never be universalized; that is, we must only speak of *certain* particular instances of power, e.g., sovereign, disciplinary, bio-political power.

ମ୍ଚର

Angela Wang

Faculty: Hannah Feldman

From Jam to Brand: The Aesthetic Language of Occupy Wall Street

On September 17, 2011, thousands of Americans flooded into lower Manhattan to protest economic inequality and corporate greed. Many of them set up camp for the long haul, becoming publicly known as Occupy Wall Street. This movement, which quickly became global, was incited by a blog post created by the Canadian culture jamming group Adbusters. The post, which made use of compelling visual imagery, furnished the public with the Twitter hashtag #OccupyWallSt, wedding the movement to social media and anticipating a viral dissemination. This thesis argues that Adbusters appropriated corporate advertising tactics to establish a brand for Occupy Wall Street. Yet, the fundamental objective of marketing—profit—was absent from Adbusters' program. The lack of a bankable product or service has allowed the idea of "Occupy" to seep through public consciousness and take on meaning in every new context it enters. It has been re-formed and disgorged by myriad groups and individuals around the world, forging a new, democratic, aesthetic dialogue. This ephemeral visual language relies on citizen participation to thrive.

ഇന്ദ

Maria Wang

Faculty: Stuart Wagenius

Germination Techniques for *Dichanthelium leibergii*, a Cool Season Prairie Grass Affected by Habitat Fragmentation

Habitat fragmentation threatens the persistence of tallgrass prairie, a globally endangered biome. Efforts to restore prairie habitat include reintroduction of native prairie species in old agricultural fields. Effective restorations should utilize a variety of warm and cool season grasses, forbs, and legumes, to reflect the diversity of plant functional roles in the original prairie. However, cool season grasses are often overlooked in restorations, perhaps because of the lack of studies on them. Dichanthelium leibergii is a native cool season prairie grass that is greatly impacted by habitat fragmentation. As a good indicator of prairie health, D. leibergii is potentially useful in restorations. My overall goal is to study the differential effects of habitat fragmentation on seed germination and plant fitness of D. leibergii populations. This study aims to identify techniques that maximize seed germination. I conducted a germination experiment employing three factors, each with two levels: cold-moist stratification (storage under cold-moist conditions); scarification (seed coat removal); and two temperature regimes (25/15°C or 20/10°C). Seedling emergence was recorded for 3 weeks. Stratification and scarification increased germination rates 3-4 fold when employed separately, but lowered germination rates when combined (GLM with quasibinomial response, n = 30 dishes, 886 seeds, p<0.0001). Scarification without stratification yielded maximal germination (34.7% + / - 5.2%), 1 s.e.) and scarification with stratification the lowest (5.1 % +/- 2.0%, 1 s.e.). Temperature was not a significant factor. My findings provide valuable information for restoration efforts and my upcoming study of the effects of habitat fragmentation on D. leibergii populations.

ନ୍ଧର୍ୟ

Rebekah Ward

Faculty: Masaya Yoshida

A Test of Syntactic Island Effects

The unacceptability arising from extraction out of islands has long been controversial. The point of contention is whether island effects are formal constraints on syntactic structures or whether they result from more general considerations involving the processing load. Given this debate, our study aims to examine whether online reading difficulty associated with wh-filler storage, plus processing of intervening material between the *wh*-filler and the gap (interveners), is the cause of island effects. It has been argued that island effects result from the processing overload caused by combining the costs of *wh*-filler storage in working memory and of processing resource-demanding interveners (i.e., the processing account). We test this hypothesis through two experiments: a self-paced moving-window task, and an acceptability rating task. The WH (*wh*-filler vs. *if*) × Gap-position (island-internal gap, IG, vs. island-external gap, EG) conditions were manipulated as independent factors in 2×2 design. Taken together, the processing account predicts a main effect of WH both in reading time of the relevant regions and in acceptability rating. On the other hand, the grammar-based account predicts that (1a), as an island-violating sentence, should be rated significantly less acceptable than the other conditions, but it does not predict anything about the reading time pattern

regarding the relevant regions. We find a main effect of WH in the self-paced reading experiment; however, in the acceptability rating experiment, we find an interaction of WH \times Gap position as island violating (1a) is rated significantly less acceptable than all other conditions. This discrepancy between reading-time and offline rating results shows that Gap-position is a crucial factor for the low-acceptability of island domains.

ନ୍ଧର୍ୟ

Myrtie Williams

Faculty: Michelle Wright

Our Voices Are PowerFro: Black Women and the Development of Diaspora Identity in the Online Natural Hair Community

Despite the prevalence of chemical hair curling, straightening, and dying in dominant American culture the signifier "natural" in regard to hair styling has been generally confined to its use by black and African diaspora communities. This confinement speaks both to the normalization of hair straightening processes in black communities and to the inferior racial, historical, and ideological representations to which natural hair responds. At present there is a whole generation of black women who have never experienced the texture of their hair as it grows out of their heads; who have gotten their natural hair processed so young and for so many years that it is all that they know. Thus, "going natural" is an educational process for black women in the new millennium, and with the expansion of the internet, an online community has formed to offer support, guidance, and solidarity in this effort. As the online community gathers around an awareness of the process of "othering" to which black natural hair has been subjected, contributions have come out of every area of the African diaspora allowing the community to serve as an effective means of developing a continuous diaspora identity. Through critical readings and engagement with online natural hair blogs and video blogs I uncover the development of diaspora networks and points of identification formed between black women internationally through the collective performance of wearing natural hair.

୬୦୧୪

Alexandra Wong

Faculty: Thomas McDade

Looking Older Than Your Peers: Self-Perceived Relative Maturity and the Development of Risky Behavior in Adolescents from the Mobile Youth Survey

Risky behavior is often considered a normal part of adolescent development, but self-destructive behaviors can have adverse consequences for adolescents, their families, and communities. Evolutionary life history theory posits that it is advantageous for humans living in stressful environments to reach reproductive maturation earlier and adopt risky behavior in order to increase their chances of reproductive success. This study used data collected by the Mobile Youth Survey in 2006 to investigate whether or not environmental stress, represented by neighborhood violence and single-mother households, predicts early physical maturation, thereby creating a pathway to

adolescent risky behavior. The sample consisted of adolescents aged 9-19 from low-income neighborhoods in Mobile, Alabama. A questionnaire was administered to participants asking them about their relationships with their families, friends, and communities, as well as their involvement in health-compromising behaviors. Risky behavior was measured by responses to questions about smoking cigarettes, using marijuana, drinking alcohol and having sexual intercourse. Participants were also asked if they look older, about the same, or younger than their peers of the same age to measure self-perceived relative maturity. Neighborhood violence, but not single-mother households, predicted self-perceived advanced maturity. In males, neighborhood violence was the strongest predictor of engagement in risky behaviors, whereas in females both neighborhood violence and self-perceived advanced maturity significantly predicted increased engagement in risk behavior. These findings highlight adolescent gender differences and support the life history theory explanation for the evolution of risky behavior in humans.

ഗ്രരു

Chloe Woodhouse

Faculty: Leo Towle, University of Chicago Hospital

Gamma Band Activity in Mathematical and Verbal Semantic Memory Retrieval: Invasive Neurophysiologic Brain Mapping

12 epileptic patients that were going to undergo surgery had subdural electrodes placed over their frontal, temporal, and parietal lobes. The activity of these electrodes was then recorded using electrocorticography. In previous studies of subdural electrocortigraphic readings, power spectra from electrodes placed near the primary auditory cortex were significantly enhanced in the high gamma band (approximately 70 to 200 Hz) during language tasks. Gamma activity also increased in response to task events, such as hearing a tone, hearing a word, and repeating a word. As such, cortical language and memory related areas were identified based on the emission of increased activity in the high gamma band during formal language and memory tasks. Patients were given a set of 9 conversational questions to test their semantic verbal memory and long-term memory. Patients heard a tone stimulus followed by a voice recording of a question (i.e. "what color is your house?"). Their gamma activity and the latency of their response (voice-onset time) were recorded. In order to test short term memory and word recall, patients were asked to simply repeat a word presented visually on a computer screen or auditorily from a voice recording. A tone or fixation point (for the voice recording or visual word, respectively) preceded each of the 50 words by 1 second. After a 1minute delay, during which the patient was asked basic arithmetic tasks (i.e. $3 \ge 5 = 2$) to prevent rehearsal, they were given two minutes to recall as many of the words as they are able to. This was done to activate areas in the temporal lobe related to short-term verbal memory retrieval. After examining the data, it is clear that verbal semantic memory is present in various areas of the brain, including the frontal, temporal, and parietal lobe. After initial comprehension takes place in Wernicke's area, memory retrieval involves a spread of gamma activity throughout various regions, though this gamma activation is notably longer in arithmetic memory than in verbal semantic memory. This indicates that memory retrieval (both verbal and arithmetic) utilizes a widely distributed functional network, and may indicate a longer retention of arithmetic memory over verbal semantic memory. In the context of epileptic surgeries, this reveals that epileptic foci in areas associated with arithmetic memory are less likely to be effected by a resection. What's more, it points

to the fact that given the extensive and distributive nature of memory, some verbal memory or long term memory damage may be unavoidable.

୬୦୧୪

Eric Yarnik

Faculty: Paul Reber

Specificity in Implicit Skill Learning from Practice

Motor-skill expertise develops from practice by implicit learning that leads to gradually improving performance. A key question about this procedural learning is how specific the knowledge may be to what is practiced. Previous research using the Serial Interception Sequence Learning (SISL) found that changing any component of a practiced motor sequence reduced performance to baseline, untrained levels. To further test the inflexibility of practice-driven learning, two experiments tested participants under conditions that manipulated the motor and perceptual components between training and test. In the SISL task, participants respond to scrolling visual cues that follow a covertly-embedded repeating sequence. For Experiment 1, the action and timing elements of responding were separated across hands to test whether participants could use their training when timing or order were selectively changed. Only partial transfer was found. Action selection benefited from practice after timing was changed when timing responses depended on a different hand. In Experiment 2, the presentation of response cues was changed after training from occurring in a single column to four separate columns. Even when the trained motor sequence was exactly the same, this change the perceptual cues led to only partial transfer and a significant drop in performance. In both experiments, performance was found to be generally specific to training conditions with only partial transfer to slightly different test circumstances. In addition, in Experiment 2, participants completed a "Big 5" personality assessment to identify potential individual differences in learning and transfer. Trends for a correlation between measures of Openness and Agreeableness with the amount of transfer suggest that personality variables may predict individual differences in skill learning. Overall, these results suggest that implicit skill learning through practice produces task knowledge that is very specific to training and difficult to apply to even subtly different test conditions.

ନ୍ଧର

Elizabeth Yates

Faculty: Erin Waxenbaum

Testing Allen's Rule: Ecogeographic Variation in Three Native North American Human Samples

Allen's Rule is a well-recognized biological trend that describes ecogeographic variation. This rule suggests that homeothermic organisms in warmer climates will exhibit longer limbs than organisms in colder environments. This study tests the validity of this rule as applied to three native North American human populations from New Mexico, South Dakota and Alaska, using latitude as a proxy for climate. Allen's rule is tested in these populations using Bonferroni-corrected t-tests in

STATA 10 IC. While the South Dakota sample does not accord with the expected trend under Allen's rule, the relationship between the New Mexico and Alaska samples exhibits the expected variation trend. The results of this study contribute to the growing literature on the validity of Allen's rule and suggest questions for further research about male and female differences in ecogeographic variation and the biological mechanism that underlies this phenomenon.

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Jennifer Yu

Faculty: Valerie Kilman

The Role of the *Clock* Gene in Protection against Neural and Retinal Degeneration

A circadian rhythm is a conserved biological phenomenon where gene expression and protein activity are regulated in roughly twenty-four hour cycles to yield changes in behavior and activity of numerous biological systems. The circadian system is an important focus of research because it influences critical processes, such as metabolism and sleep, and circadian rhythm disruption is observed in patients with a variety of diseases, including neurodegenerative diseases such as Alzheimer's and Parkinson's. Clock (Clk) is a primary circadian gene in both humans and Drosophila melanogaster, or the fruit fly. We hypothesized that normal circadian rhythms resulting from Clk expression protects neurons from daily use-dependent damage resulting in degeneration. Mendelian genetic crosses of D. melanogaster mutants were used to test whether Clk has a protective role. I show evidence that mutants lacking sufficient functional Clk, known as Jerk (Jrk) mutants, display neurodegeneration of a subset of circadian neurons that is rescued by Clk overexpression. Irk mutants are also more susceptible to light-induced retinal degeneration. The underlying molecular mechanism of these results is still under investigation but our data suggests that Clk is not functioning through blocking the apoptosis pathway. The results from this project will contribute to a greater understanding of the relationship between neurodegenerative diseases, such as Alzheimer's, and circadian rhythm disruption. The project also has public health implications because a large proportion of the population, especially shift workers, have disrupted circadian rhythms that may lead to increased risk of disease.

So Guide to Undergraduate Research Programs at Northwestern University

This year the Office of the Provost created a searchable database of undergraduate opportunities across campus called the Undergrad ARCH, and we hope that when combined with our recent web site redesign will offer students a comprehensive way to explore their research/creative options. Below is a partial listing of current Northwestern programs supporting independent undergraduate research and creative projects; more are available on the UR@NU web site. Many departments and programs may also have other opportunities that are not widely advertised. External agencies also fund a number of programs, such as the National Science Foundation or the Fulbright IIE government grants. The Office of Fellowships (www.northwestern.edu/fellowships) can help students identify these external opportunities.

UR@NU-Undergraduate Research at Northwestern University

undergradresearch.northwestern.edu

Undergrad ARCH- Search Engine

undergradresearch.northwestern.edu/research-opportunities

Office of the Provost Sponsored Programs

Academic Year Undergraduate Research Grants (AY URG) undergradresearch.northwestern.edu/ayurg Summer Undergraduate Research Grants (Summer URG) undergradresearch.northwestern.edu/summerurg Conference Travel Grants undergradresearch.northwestern.edu/ctg Undergraduate Language Grants undergradresearch.northwestern.edu/ulg Circumnavigators Travel-Study Grant undergradresearch.northwestern.edu/circumnavigators Undergraduate Engagement Grants undergradresearch.northwestern.edu/ueg Undergraduate Research Assistant Program undergradresearch.northwestern.edu/urap

Other University-Wide Programs

Residential College Fellow Research Assistance Program (FARA): Nancy Anderson (n-anderson@northwestern.edu) Institute for Policy Research: www.northwestern.edu/ipr/ugradresearch.html Center for Global Engagement: www.bcics.northwestern.edu/grants/cge/ Office of International Program Development: www.ipd.northwestern.edu/fellowships/index.html

So Guide to Undergraduate Research Programs at Northwestern University, continued

Weinberg College of Arts and Sciences

WCAS Awards: www.weinberg.northwestern.edu/advising/honors/funding/ African Studies: www.northwestern.edu/african-studies/undergraduate-studies/awards.html Anthropology: www.anthropology.northwestern.edu/about/labs.html Astrophysics: ciera.northwestern.edu/Research/undergraduate_research_opportunities.php Biochemistry-Morimoto Laboratory Undergraduate Research Seminars: www.biochem.northwestern.edu/ibis/morimoto/morimotolab/murs.html Biological Sciences: www.biosci.northwestern.edu/undergraduate/research.html Chemistry: www.clp.northwestern.edu/education/student-programs Chicago Field Studies Program: www.wcas.northwestern.edu/cfs/ History: Leopold Fellows of the Center for Historical Studies: www.historicalstudies.northwestern.edu/leopold.htm Latin American and Caribbean Studies: www.wcas.northwestern.edu/lacs/grants/udgp.html Mathematics: www.math.northwestern.edu/undergraduate/summer.html Physics and Astronomy: wildcat.phys.northwestern.edu/ugresearch.html Political Science: www.polisci.northwestern.edu/undergraduate/ginsberg.html Psychology: www.wcas.northwestern.edu/psych/undergraduate_studies/research_opportunities/

School of Communications

Film & Theatre Projects: Rick Morris (r-morris@northwestern.edu) Undergraduate Research Grants and Fellowships: Jane Rankin (j-rankin@northwestern.edu)

School for Education and Social Policy

Research in SESP: www.sesp.northwestern.edu/ugrad/opportunities/research/

McCormick School of Engineering and Applied Science McCormickOpportunities: www.mccormick.northwestern.edu/undergraduates/ current_students/research_opportunities/index.html Biomedical Engineering: www.bme.northwestern.edu/current/undergraduate/research.html Chemical & Biological Engineering: www.chem-biol-eng.northwestern.edu/undergraduate/current/research/index.html Electrical Engineering and Computer Science: www.eecs.northwestern.edu/research/undergraduate-research.html Materials Research Science and Engineering Center: www.mrsec.northwestern.edu/content/educational_programs/index.htm McCormick Office of Corporate Relations, Corporate Partner Undergraduate Research Grants: www.industry.northwestern.edu/students/research.php Nanoscale Science and Engineering Center: www.nsec.northwestern.edu/REU.htm

<u>Medill School of Journalism</u> Eric Lund Global Reporting and Research Fund: www.medill.northwestern.edu/journalism/undergrad/page.aspx?id=60867

50 The Afterlife of Research

The most important step in research, and often the most over-looked for undergraduate researchers, is sharing the research findings. This final step allows for the vital process of peer review and contributes to the ongoing development of our knowledge about the world. Moreover, research is a cumulative process that grows from one project to another. Another aspect of the afterlife of your research is how you transform it into new and related projects. Below are some examples of programs that have been developed at both Northwestern and nationally to help undergraduate researchers participate in and learn from the final step in the research process.

Present Your Research

Northwestern's Annual Undergraduate Research and Arts Exposition: undergradresearch.northwestern.edu/expo

Chicago Area Undergraduate Research Symposium: www.caurs.com

Academic Conferences: consult with your advisor for major conferences in your field and apply for funding through the Conference Travel Grant program: undergradresearch.northwestern.edu/conference-travel-grants-ctg

Publish Your Research

Northwestern Undergraduate Research Journal: www.northwestern-urj.org/

Nanoscape (Journal of Undergraduate Research in Nanoscience): www.nanoscape.northwestern.edu/

Directory of Undergraduate Research Journals (UNC Office for Undergraduate Research): www.unc.edu/depts/our/students/students_publish.html

Transform Your Research

Apply for National & International Research Grants: www.northwestern.edu/fellowships

Apply for Graduate School: consult with your advisor for the best programs in your field and apply for funding through the Office of Fellowships: www.northwestern.edu/fellowships